The MINING CONGRESS JOURNAL

Volume 16 MAY, 1930 No. 5

COAL CONVENTION

THE COAL INDUSTRY MEETS

THE NATIONAL EXPOSITION
of Coal Mine Equipment

• • •

WILDWOOD—
A 100 Percent Mechanized Mine

Personnel Training
with Mechanized Loading

• • •

Analytical Valuations
in Income Taxation of Mines

Pennsylvania's School
of Mineral Industries

Metal Industry and Mining School

• • •

Inclined Cut and Fill
and Semi-Shrinkage Mining Methods
at Campbell Mine

• • •

Legislative Review

CONTRIBUTORS:

R. C. Allen
Milnor Roberts
Edward Steidle
W. P. Vance
H. M. Lavender
G. B. Southward

AND EXPOSITION

THE

FORWARD MARCH OF Modernization

With ever increasing impetus the Coal Industry is swinging into a highly beneficial program of scientific management and mechanized operation.

Accurately predetermined development programs are displacing old time rule-of-thumb methods. Highly efficient mechanical equipment is raising the morale of the individual worker by vastly increasing his productive power. Coal Mining has taken its place with other great industries in the forward march of modernization.

Through it all runs an equally increased regard for the safety of every individual employed—with highly developed methods for his protection against injury through violent accident or unhealthful working conditions.

In this movement for greater safety we have a vital interest, and are playing a definite part—as the oldest and largest manufacturer of Safety Fuse for blasting.

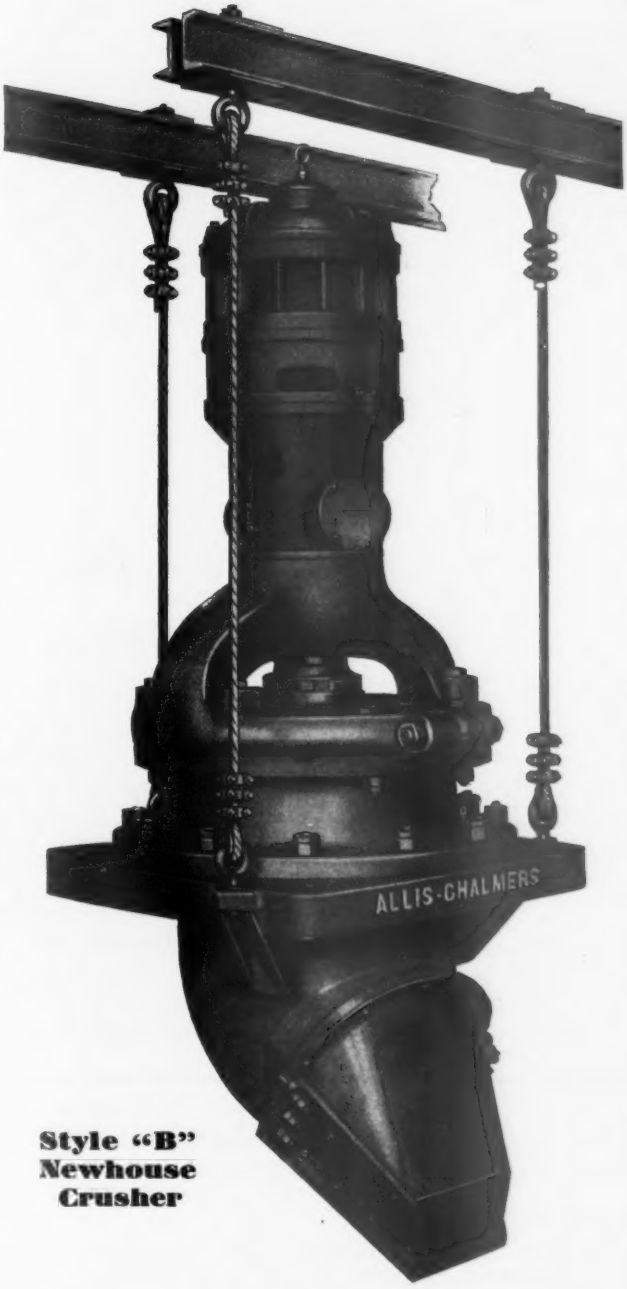
Do Not "Short Fuse" -- Fuse should be cut long enough for the end to extend well out of the mouth of the bore hole when the primer cartridge is in place.
All holes should be well tamped.

THE ENSIGN-BICKFORD CO.
SIMSBURY **CONNECTICUT**

THE ENSIGN-BICKFORD CO. 1836 SAFETY FUSE 1930 SIMSBURY, CONN.

When you are buying Crushers

what points do you consider?



Style "B" Newhouse Crusher

First of all, you want a crusher that will yield best return on your money. That includes, not only first cost, but also maintenance and operating costs.

You want a crusher easy to feed and that will produce a maximum capacity of stone of desirable shape and screen analysis. It should be of simple construction with internal parts readily accessible, and that has been thoroughly tested under actual operating conditions.

The Newhouse Crusher is such a machine. Its short, rapid, crushing stroke gives it high capacity with a high percentage of the finished product of desired shape and size. It has a high ratio of reduction. Its direct-connected motor, cable suspension, positive oiling system, and simple and sturdy construction are other advantages. And it is built by a Company with over 50 years experience in the building of crushing machinery.

Products of Allis-Chalmers

Complete equipment for crushing, screening, and cement plants; mining and metallurigal plants;—jaw, gyratory and roll crushers; rotating and vibrating screens; multi-roll sizers; elevators, and hoists; washing equipment; motors, pumps and drives.

Write for a bulletin on Allis-Chalmers crushing plant equipment.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

The MINING CONGRESS JOURNAL

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Practical Operating Men's Department

COAL

Wildwood—A 100 Percent Mechanized Mine

METAL

Inclined Cut and Fill and Semi-Shrinkage Methods of Mining at the Campbell Mine

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Skinny Discovers a *Peach* of a Loading Machine

Skinny: Did you hear about that new Jeffrey loading machine they are runnin' on the second East?

Bill: Yea, I heard about it, but ain't seen it yet.

Skinny: The Super won't let no one see it, but Pete Sickcowski, that Polish feller what's runnin' it says she is a peach. Pete has been runnin' all kinds o' loading machines, but says this one takes the cake.

Bill: What does she look like?

Skinny: I don't know, 'cause as I said they won't let no one in to see it, but Pete says she cleans up the bottom the same as if you shoveled by hand, an' she ain't heavy neither; he says she don't weigh no more than a shortwall machine.

Bill: What do they call her?

Skinny: The 44-C.

Bill: See what?

Skinny: Aw, see nothing, letter "C" same as in Kid. Pete says he can do miracles with it.

Bill: Do you believe in miracles?

Skinny: Sure, I seen one yesterday.

Bill: How's that?

Skinny: Them two fellers what lives down on the same alley I does was standin' on the corner. One of 'em is named Wood an' the other Stone, an' while I was watchin' Wood turned to Stone and Stone turned to Wood, and then a pretty girl went by an' they both turned to rubber.

The Jeffrey Manufacturing Company

958-99 North Fourth St., Columbus, Ohio

BRANCH OFFICES: New York Philadelphia Pittsburgh Scranton, Pa. Charleston, W. Va. Chicago Denver Salt Lake City Birmingham
SALES AND SERVICE STATIONS: Pittsburgh, 600 Second Avenue Scranton, 122 Adams Avenue Terre Haute, Ind., 319 Cherry Street
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Jeffrey Manufacturing Co., Ltd., of Canada. *Head Office and Works:* Montreal; *Branch Office*, Toronto; *Service Station*, 210 Ninth Ave., W. Calgary

JEFFREY COAL MINE EQUIPMENT

OXWELDING

•• THE FOE OF FRICTION

INDUSTRY no longer scraps metal parts that have become badly worn. By oxy-acetylene welding such parts are readily built up to size and returned to service as good as new.

Often wear indicates the desirability of special qualities in the wearing surfaces. Oxwelding provides a rapid and effective means of applying bronze as well as abrasion resisting materials such as Haynes Stellite, thus minimizing the necessity for further renewal.

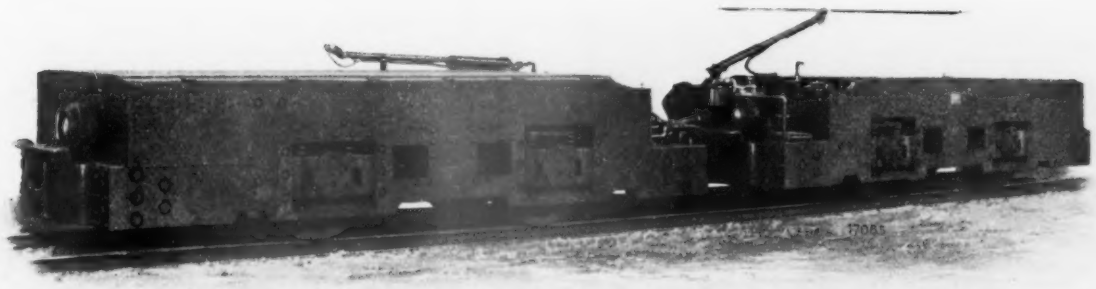
Millions of dollars a year are saved in American industry by oxwelding — the foe of friction.

THE LINDE AIR PRODUCTS COMPANY, THE PREST-O-LITE COMPANY, INC.,
OXWELD ACETYLENE COMPANY, UNION CARBIDE SALES COMPANY,

Units of UNION CARBIDE AND CARBON CORPORATION

General Offices . . . . . New York UCC Sales Offices . . . . in the Principal Cities

65 Linde plants . . . 48 Prest-O-Lite plants . . . 174 Oxygen Warehouse stocks . . . 156 Acetylene Warehouse stocks . . . 42 Apparatus Warehouse stocks . . . 245 Union Carbide Warehouse stocks



Jeffrey 40-ton Haulage Locomotive

The Might of 600 Horses

Jeffrey 40-Ton Haulage Locomotive

THIS big, husky 40 ton tandem locomotive will stand up under the severest service. Built tandem—really two locomotives in one—each may be used separately.

Two 150 H.P. motors in each unit—a total of 600 H.P. available at one controller, and at one drawbar.

Full magnetic control—progressive series parallel. Reversing by contactors—contactors identical with the rugged locomotive type contactors used for controlling the motors.

Interpole D. C. Motors — completely enclosed, with enclosed terminal board for cable connections to motor.

Anti-friction Bearings Throughout—Roller bearings are provided on the armature shaft, on the axles where motors are suspended, and in the journal boxes.

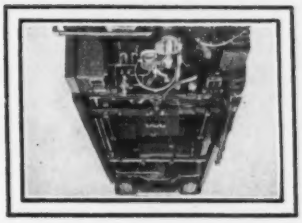
All parts accessible—top half of motor comes off without disturbing gear case—motor comes off axle without disturbing the housing for the roller bearings that support it on the axle.

Renewable split rim gears—renewed without removing axle from locomotive. Each journal box is provided with a pair of long, flexible springs one on each side of the axle, the lower end of the spring resting on the bottom of pockets well below the axle, making a stable suspension that has no tendency to bind in the journal box guides. This insures proper freedom of motion for the journal box and minimizes wear on the guides. A cross equalizer is provided that does not interfere with accessibility of equipment in the locomotive frame.

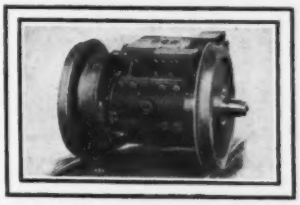
Air brakes—air sanders—air whistle.

It is the locomotive for your tough haulage jobs—let us send you descriptive literature.

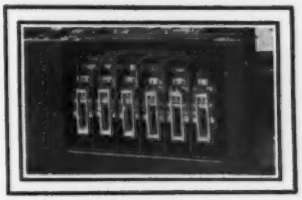
Jeffrey makes every kind of mine locomotive, from tiny but powerful low seam jobs up to this giant.



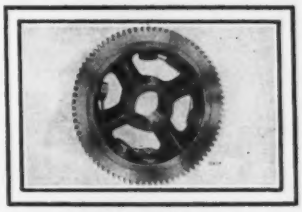
Chassis with top off, showing rolled slab sides and internal mechanism



Roller Bearing axle assembly with through bolts



Magnetic contactors



Renewable split rim gear

The Jeffrey Manufacturing Company

958-99 North Fourth St., Columbus, Ohio

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Ft. Smith, Ark., 217 S. 5th St.

Jeffrey Manufacturing Company, Ltd., of Canada
Head Office and Works, Montreal—Branch Office, Toronto—Service Station, 210 Ninth Ave., W. Calgary

JEFFREY COAL MINE EQUIPMENT

GIANT
S.G. #1
Averaging 105
1¼ x 8' Cartridges
to the 50 lb. Case

GIANT
S.G. #3
Averaging 125
1¼ x 8' Cartridges
to the 50 lb. Case

GIANT
S.G. #5
Averaging 145
1¼ x 8' Cartridges
to the 50 lb. Case

SEMI GELATIN EXPLOSIVES

The field for the Semi Gelatin Explosives announced herewith comprises those situations wherein the moisture and ventilation factors are not severe.

For surface work, Giant S. G. #1, which is a plastic explosive, can be used with assurance for the bottom charge in well drill holes in quarrying so long as the charge is fired within a reasonable period of time. Giant S. G. #3 and S. G. #5, being cohesive rather than plastic in consistency, are less water resisting and their use in surface work should be confined to fairly dry situations. Economy is assured in highway construction work by the use of this series of explosives.

For underground usage, Giant S. G. #1 is suitable for fairly wet situations in exploration and development work under favorable conditions as regards ventilation. Good ventilation also governs the usage underground of Giant S. G. #3 and #5 in stope blasting. The cohesive characteristics of the ingredients of these grades permit of cartridges remaining in place when tamped in upward pointing bore holes.

The adaptability of the various grades of this series can only be proved by actual tests and we can supply trained men to aid you in reaching a decision. Write to the nearest Branch Office for this aid, or to:

THE GIANT POWDER CO., Con.

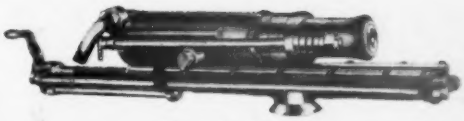
"EVERYTHING FOR BLASTING"

Crocker First National Bank Bldg., SAN FRANCISCO, CAL.

Branch Offices:
Butte, Montana
Los Angeles, California
Salt Lake City, Utah

GIANT

Branch Offices:
Seattle, Washington
Spokane, Washington
Portland, Oregon



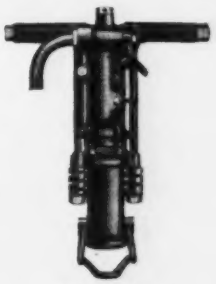
Full Line of Drifting Drills

LO-3 Line Oiler

Are You Equipped?

We offer a full line of rock drills for your shafts, adits and other rock work, as well as auger drills and utility drills for taking out coal in the anthracite and other fields where blasting is the mining practice. We have a Sales Branch near you, let us have a representative call on you.

Auger Drill



Medium Weight Utility Drill

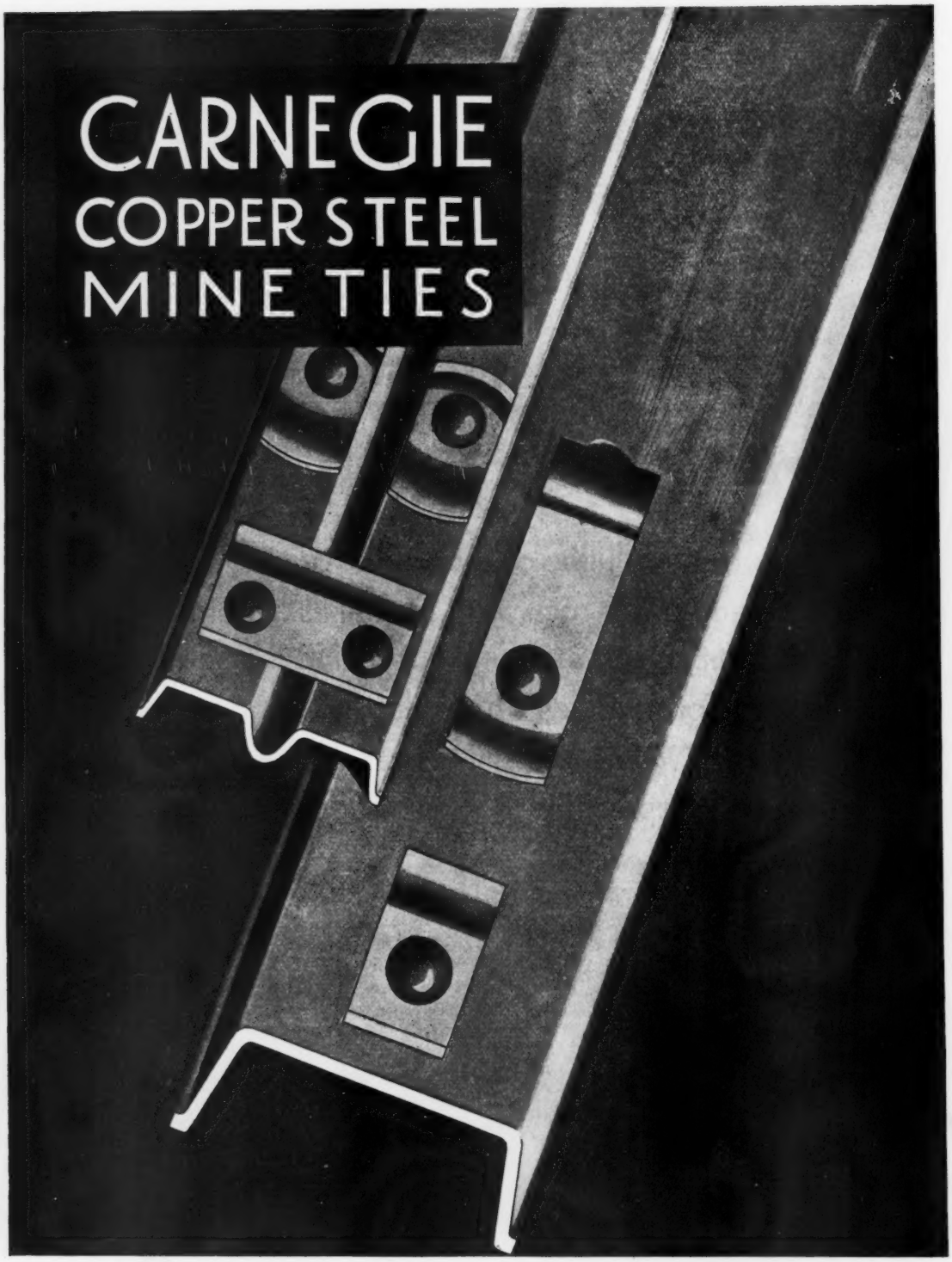
Light Weight Utility Drill

GARDNER-DENVER COMPANY

QUINCY, ILL. DENVER, COLO.

SALES OFFICES THROUGHOUT THE WORLD

GARDNER-DENVER



HERE are the two most popular Carnegie Copper Steel Mine Ties. A light tie for room work. A heavy tie for main haulage ways. Popular because they're easily and quickly laid. Because they're economical. Because they're rust-resisting. But our catalogue tells the whole story. Send for it today. It shows a number of ties, varying from 2-1/2 to 9 pounds per foot, and from 11/16" to 2-1/4" in height. A variety of clips and fastenings are also available, so that your individual needs may be accurately met.

Carnegie Copper Steel Mine Ties will efficiently solve your track problem.

CARNEGIE STEEL COMPANY ✣ PITTSBURGH, PA.

Subsidiary of United States Steel Corporation

68

The AMERICAN MINING CONGRESS Little Exposition

The AMERICAN MINING CONGRESS "Little Exposition"

GOVERNMENT EXPOSITION

AT Cincinnati this month, note the requirements for efficient conveyor operation as expressed by practical and experienced coal men—reliability, durability, flexibility, economy of operation and safety.

Then, compare these requirements with the claims of *all* conveyor system manufacturers—and Cosco's record *in the mines*. There will be little doubt in your mind after such a comparison as to the manner in which the Cosco Shaker Conveyor meets every requirement.

For Cosco Shaker Conveyors have made good not only at every Coal Convention since they were first introduced, but in more than four hundred mine installations they are today speeding production, cutting costs and building profits.

The Cosco Shaker Conveyor with the "Duckbill" makes a most efficient Heading Machine.

COSCO Shaker

The AMERICAN MINING CONGRESS "Little Exposition"

APPROVED

APPROVED

"Convey your coal The COSCO way"

THE new Cosco B E-15 Shaker Conveyor Drive is the first American made Shaker Conveyor Motor and Control ever to meet the Government standards of permissibility. Through its development, the last argument that any mine owner can offer against mechanization of his coal conveying system is removed.

And the same simplicity and ruggedness of construction which give the motor and control permissibility, also impart to them longer life and durability. There is no better Shaker Conveyor or Drive than Cosco—a statement we stand ready to PROVE, upon your invitation.

Write to us about your conveying problems and call on us at Booth 65 at the Cincinnati Exposition.

CONVEYOR SALES CO., INC.

299 Broadway, New York

District Sales Offices

Birmingham, Ala., 1802 American Trust Bldg.
Pittsburgh, Pa., 1538 Montier Street, Wilkinsburg.
Scranton, Pa., Mears Building.
Huntington, W. Va., 817 Tenth Avenue.
Knoxville, Tenn., 2725 Magnolia Avenue.
Salt Lake City, Utah, Salt Lake Hardware Co.
Denver, Colo., Stearns Roger Mfg. Co.
Pittsburg, Kansas.
Chicago, Ill., 224 South Michigan Avenue.

CONVEYOR

The AMERICAN MINING CONGRESS "Little Exposition"

TEN minutes spent may save HUNDREDS

The Latest and Newest O-B Development

The O-B Safety Switch is the latest and newest O-B development. This is a quick-make, quick-break switch. A blow-out coil extinguishes the arc. The purpose of this switch is to enable men to disconnect large amperage feeder circuits without danger of burning his hands or arms; or even worse. Something new in safety devices; something which you certainly will want to investigate.

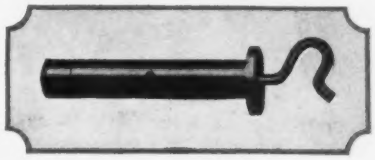
The AMERICAN MINING CONGRESS "Little Exposition"

with these Devices of DOLLARS

INJURIES to workmen, inoperative mine sections, motor troubles, burned trailing cables — what do they mean in terms of lost production?—in terms of dollars and cents? Can the frequency with which these hazards occur be greatly reduced, or can they be eliminated entirely? The O-B answer is worthy of the utmost consideration. Ten minutes of your time while at the Cincinnati Convention, if spent in learning about the application and operation of the new O-B Safety Devices may save hundreds of dollars. Each of these devices fulfills an economic need in the scheme of safe and profitable mining.

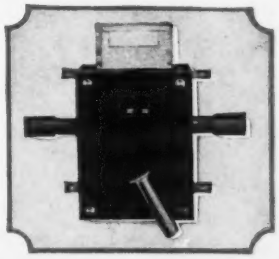
Are you interested in added safety to men and machines? Here are safety devices that will develop a phase of safety which gives rich rewards. Are you interested in securing large returns on a small investment? Here are devices that will give your sense of values a pleasing shock when you learn how little they cost in proportion to the savings they effect. To see the O-B Exhibit this year is to see one of the most interesting exhibits of the convention. So come and spend a profitable half-hour at spaces 121-132.

Ohio Brass Company, Mansfield, Ohio
Canadian Ohio Brass Co. Limited
Niagara Falls, Canada
1817M



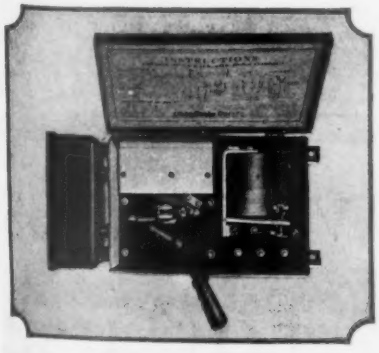
What Does Trailing Cable Cost?

Trailing cable is expensive. Why burn it up? Here is a device which will protect it. What is more, this tap will lessen the danger of gas at the face becoming ignited should the machine cable ground or become crossed. Put this tap down as one of the things you will want to investigate while at Cincinnati.



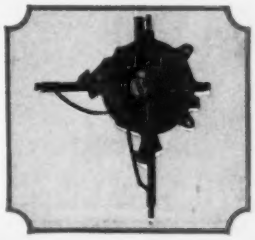
A Breaker to Eliminate Breaks in Production

You may have heard about the O-B line of Automatic Circuit Breakers, but have you seen these breakers? Do you know how they fit into the scheme of securing lower production costs by eliminating breaks in the day's out-put of tonnage? Here are circuit breakers you will surely want to see, and learn how they are saving thousands of dollars yearly for the men who use them.



This Will Catch and Hold Your Interest.

Here is something that is of particular interest to every man who wishes to protect his motors 100%, and release motor attendants for more productive labor. Are you familiar with the operating advantages of this new O-B Automatic D. C. Motor Starter? Make it a point to drop around to the O-B exhibit and learn what this starter is doing for other men.



Do You Know the Story of this Device?

Do you know the complete and interesting story of this Gas-Tight Fund Junction Box? It is a story of protection to the pocketbook, to mines, to men, to machines, and to production. While you are at the O-B Exhibit, do not fail to learn just how and why this O-B safety device saves money.

Ohio Brass Co.

NEW YORK PITTSBURGH CHICAGO CLEVELAND ST. LOUIS ATLANTA DALLAS
PHILADELPHIA BOSTON LOS ANGELES SAN FRANCISCO SEATTLE

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

FLEXIBILITY

High Annual Loading Records

RELIABILITY

Large CAPACITY

PROVEN EFFICIENCY

Logical Mech

ONE MAN CONTROL

Established Reputation

LOW COSTS

See this machine at Cincinnati in

The many advantages are now available for use in LOW COAL

STURDY

Easy Operation

anism

HIGH PRODUCTION

JOY LOADERS

The conveyor of the Joy 7-B U can be instantly flexed 45° to either side of center or raised and lowered to 36 inches from horizontal. The single strand, universal link, roller flight conveyor conforms to any flexed position of the conveyor trough.

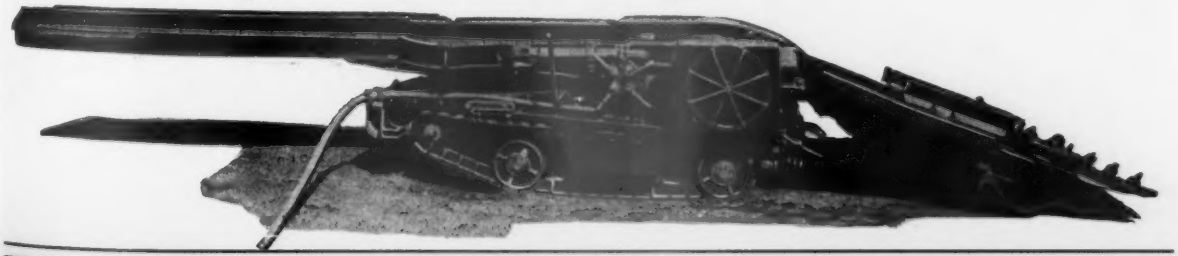
GUARANTEED CAPACITY TWO TONS PER MINUTE

Joy machines have made coal loading history. Every year is a greater JOY year. But here is a new chapter in this history, giving new possibilities to the coal producer. The Joy 7-B U, designed for use in low coal, is 40 inches high. Its conveyor is its unique feature. Otherwise it is identical with the larger 5-B U. One man control, two tons per minute, moves on or off track, and is generally adaptable to all mining conditions.

Booths 133, 134

JOY MANUFACTURING COMPANY
FRANKLIN, PENNSYLVANIA

# of Joy Loading Machines



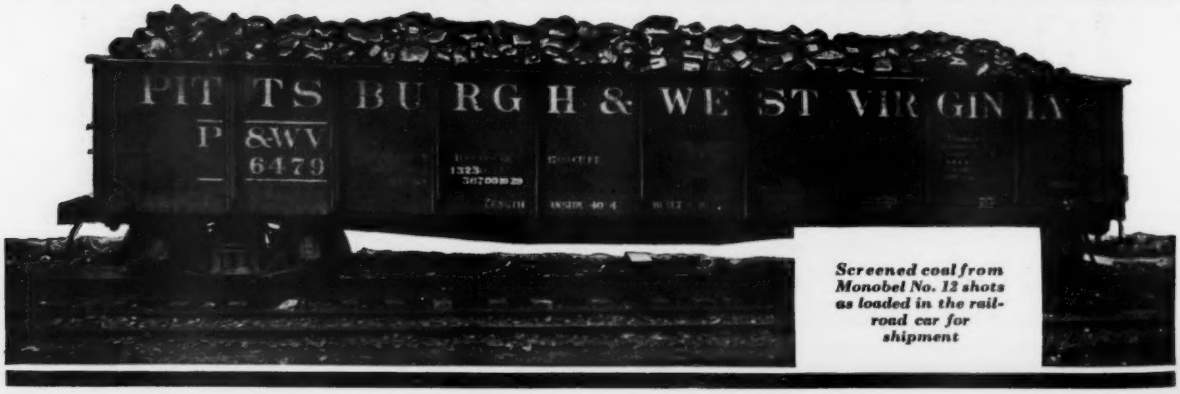
MORE LUMP

Results of blast from tight hole loaded with 3½ cartridges of Monobel No. 12, 1¼ x 8 inches

MORE LUMP COAL

Coal blasted with Monobel No. 12 as loaded in the mine cars

INTACT TO THE MARKET



Screened coal from Monobel No. 12 shots as loaded in the railroad car for shipment

COAL *when you shoot with these low-density du Pont permissibles*

DU PONT low-density permissibles have several advantages. They can usually be loaded on the same cartridge basis as denser explosives and still bring down the coal. This means a reduction in the weight strength of the charge and consequently less shattering of the coal. If there should happen to be an overcharge, the shattering is less with a low-density explosive than with an explosive which is denser.

In addition to producing more lump coal which may be reflected in a better selling price, these low-density permissibles are often cheaper to use on account of the high cartridge count.

Monobel No. 12 L. F. is a du Pont permissible especially designed for the production of lump coal. It averages 225 cartridges, 1¼" x 8", to the 50-lb. case. It is adapted for blasting low seams and thin benches where the seam is cut in the center and also thicker seams where the coal is clean and not very hard. It is quick enough to shear the coal from the roof and ribs, yet the relatively low strength and the distribution of the charge in the bore holes prevent shattering. It produces a minimum volume of fumes. Its high cartridge count makes it economical to use.

With the introduction of Duobel No. 3 L. F. . . . a new low-density permissible . . . du Pont offers you permissibles in four different ranges . . . from as low as 135 cartridges to as high as 225 cartridges to the 50-lb. case. Duobel No. 3 L. F. averages 205 sticks, 1¼" x 8", to the case. It has a unit deflective charge of 227 grains and a velocity, in the 1¼" diameter cartridge, of 10,780 feet per second.

Complete information about du Pont permissibles and their use in coal mines is given in a booklet, "Permissible Explosives," recently prepared by the du Pont Company. We shall be glad to send you, without charge, a copy of this booklet. Write for it.

Visit du Pont booths . . . 48 and 49 . . . at the American Mining Congress Convention in Cincinnati, May 5th to May 9th

DU PONT
REG. U. S. PAT. OFF.

Some du Pont explosives and purposes for which they are best suited in coal mining

PERMISSIBLES

Monobel No. 9-A L. F. A trifle stronger than Monobel No. 9. Averages 160 cartridges to the 50-lb. case. Has wide-spreading action and is adapted for producing lump coal in medium hard-shooting coal regardless of thickness. Gives off less smoke and fumes than Monobel No. 9 L. F.

Gelobel No. 3 L. F. An improved form of the original Gelobel. A very dense explosive with a high cartridge strength. Averages 95 cartridges to 50-lb. case. Highly water resisting. Especially designed for rock work in coal mines. Gives good work on hard, tight shooting, reduces hazards.

Monobel No. 8 L. F. Strong permissible of medium velocity. Averages 145 cartridges to 50-lb. case. Is adapted for producing lump coal in hard-shooting high seams where only one row of holes is used. Can be used effectively for shooting down the slate after the coal has been worked out below. Is excellent for driving narrow entries in advance of the air current. Gives off very little smoke or fumes.

Duobel L. F. First low-density permissible to be passed by Bureau of Mines. Averages 160 cartridges to 50-lb. case. Economical to use. Of low density and high velocity . . . it is a very efficient explosive. Shears the coal from the rib . . . prevents shattering . . . leaves ribs clean and brings coal down in good lump. Adapted for blasting thick seams as well as thin seams, solid coal as well as machine-cut coal.

PELLET POWDERS

Pellet Powder. An improved deflagrating explosive for use where permissible explosives are not needed. It is safer . . . more convenient to handle . . . better water resisting . . . and gives off less smoke than granular powders. In many cases it produces better lump coal.

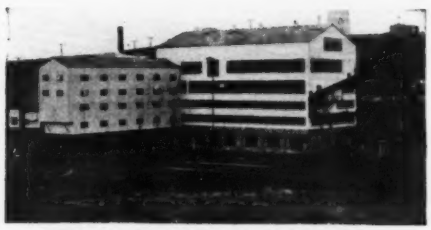
Pellet Powder L. D. No. 1. A *faster* Pellet Powder . . . recently developed. Has all advantages of fast Pellet Powder, plus greater speed in execution and more sticks to the case. Shoots coal in places where no other Pellet Powders will.

E. I. DU PONT DE NEMOURS & CO., INC. — *Explosives Department* — Wilmington, Delaware

The AMERICAN MINING CONGRESS "Little Exposition"

RHEO

CLEANE



Champion Cleaning Plant, Pittsburgh Coal Co.

Loomis Colliery, Glen Alden Coal Co.

BE SURE TO SEE THE RHEO-LAVEUR EXHIBIT BOOTH No. 32 AT CINCINNATI••

Cokedale Washery
American Smelting and Refining Co.

Koppers-Rheo Washery
Great Valley Anthracite Corporation

GIVING "CLEAN" COAL A NEW MEANING

Rheolaveur Processed Coal is recognized by many of the world's leading coal experts as the cleanest, most uniformly graded coal ever produced and they have backed their convictions by investing in Rheolaveur Coal Cleaning Plants.

From a total annual tonnage of 6,000,000 in 1919, to a tonnage of 70,000,000 in 1929, this record of world-wide approval speaks for itself. In the United States alone, the annual tonnage capacity of Rheo Plants has increased 8,500,000 tons in the last two years.

Yet the surface has only been scratched,—the potential consumer demand for Rheolaveur Processed Coal is enormous—millions of tons in excess of the present production facilities can be sold.

Are you prepared to cash-in on this situation? Koppers-Rheolaveur engineers will be glad to explain in detail the remarkable advantages of the Rheolaveur process as applied to your particular production problem.

KOPPERS-RHEOLAVEUR COMPANY

1150 KOPPERS BLDG., PITTSBURGH, PENNA.

Sales Offices

120 Broadway, New York, N. Y. First National Bank Building, Huntington, W. Va.
American Traders Bank Building, Birmingham, Ala.

Sales Office and Laboratory: Coal Exchange Building, Wilkes-Barre, Pa.

OLAVEUR
ED COAL

Black Diamond Washery, Pacific Coast Coal Co.

Banning No. 1 Cleaning Plant, Pittsburgh Coal Co.

SATISFIES THE QUALITY MARKET

Mining Costs are Lowered from year to year by field demands to which Sullivan engineers constantly respond.
45 Years of Service to coal men are back of Sullivan designs.

When You Visit The Exposition SEE THIS NEW

"CD-4" Coal Drill, at work in a Western Pennsylvania Mine

Faster, Lower-Cost drilling with This mounted self-propelling Sullivan "CD-4"

Drilling shot-holes becomes a faster, simpler, less costly operation at the mine that uses this new Sullivan "CD-4," self-contained, self-propelled electric coal drill.

Faster drilling is secured in three ways! The "CD-4" *drills* faster, it quickly *moves from place to place*, and there is *no lost time* in "setting up." A universal swivel action gives absolute accuracy in placing holes.

The following are some of the "CD-4" features and advantages:

"CD-4" is self-contained and self-propelling, (600 feet per minute maximum).

"CD-4" has 11½-ft. boom, uses either 5-ft. or 9-ft. feed screw and will drill a 9-ft. hole in 1½ minutes.

"CD-4" will put in holes anywhere in the face and at any angle, securing great accuracy in placing shots.

"CD-4" has automatic feed control and three feeds, two forward and one back.

"CD-4" carries its own cable on a self-winding reel.

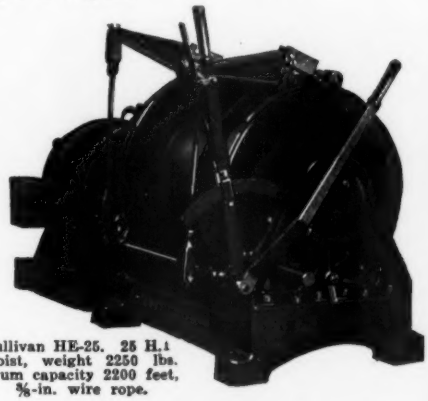
"CD-4's" 8.5 hp. motor provides ample power for both drilling and traveling and motor, controller, and reel can be furnished with explosion proof casings (Government approved).

"CD-4" has all moving parts (except chuck and spindle) fully enclosed, running in oil or grease.

New PORTABLE HOISTS for Car Pulling

In addition to the small 7½ H. P. electric hoists, widely used for many purposes in coal mine operation, Sullivan engineers now offer large, single drum hoists, especially designed for heavy duty car pulling.

These hoists have side operating clutch and brake levers, and motors from 15 to 75 H. P. They are stalwart, powerful units, simple and inexpensive to run and to maintain.



Sullivan HE-25. 25 H.P. Hoist, weight 2250 lbs. drum capacity 2200 feet, ⅝-in. wire rope.

Sullivan Coal Mining Equipment

is vastly more extensive than can be shown in the limits of our booth at Cincinnati.

Information on the following subjects will be furnished upon request to any branch office.

Diamond Core Contract Drilling
Electric Coal Loaders
"CLU" Track Cutters (for shearing as well as over-under cutting)
Low Vein Longwall Cutters
Strip Pit Channelers
Center Band Cutters
Cutter Bit Sharpeners
Rock Drills
Pick Hammers
Drill Sharpeners
Air Compressors (surface and mine car types)

Sullivan Supply Service

Sullivan equipment and spare parts are carried at 14 stock points in the United States and Canada. "Same day" shipment is regularly made of most repair and supply orders.

The AMERICAN MINING CONGRESS "Little Exposition"

Mining Congress at Cincinnati

SULLIVAN EQUIPMENT

These three representative developments in new Sullivan devices for coal mining should be closely studied. If you don't go to Cincinnati, send for the catalogs.

"CR-2" ready to go underground at Harlan, Kentucky.

A New Low-vein IRONCLAD UNDERCUTTER with Rope Feed

Coal mining men will want to see this new rope feed room and pillar Sullivan "CR-2" Low Vein Ironclad at the Mining Congress.

The "CR-2" adapts the pre-eminent success of Sullivan Low model Longwall Ironclads to room work, but is essentially an entirely new machine, designed especially for its particular work.

The rope feed is new, the result of many years of coal cutter operation.

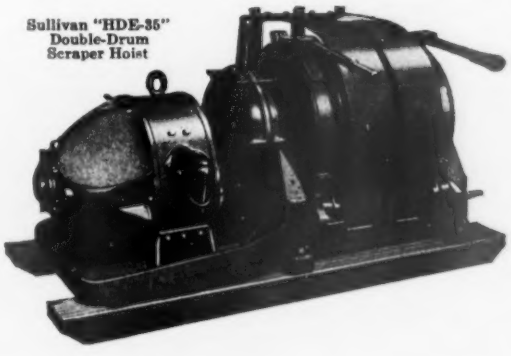
Both rope drums are live drums. Power can thus be applied to the machine in any direction, or for any operation. This gives full flexibility at all stages of cutting and handling.

"CR-2" is only 15½ inches high at the face, and 24 inches on its drop front truck shown above.

"CR-2" has cut 27 places *in one* 10-hour shift.

Sullivan also announces the "CR-3" rope feed Ironclad, for coal of ordinary thickness. "CR-3" is similar to the familiar "CE-7" chain feed Ironclad—so that you may now select the drive you prefer.

Sullivan "HDE-35" Double-Drum Scraper Hoist



New PORTABLE HOISTS for Scraper Loading

A new Sullivan Double Drum Scraper Hoist will be shown at Cincinnati, equipped with 75 H.P. motor.

Advantages of scraper loading include simplicity and low first cost of equipment; adaptability to operating conditions; ease of moving the equipment ahead to keep up with the working faces, and ability to operate in practically any height of coal, particularly low coal where mechanical loaders cannot be employed. Sullivan hoist engineers will be pleased to put their wide experience in scraper loading at the disposal of coal mine men. Bulletin 76-JC.

SULLIVAN TRADE MARK

Boston, New York, Terre Haute, Pittsburgh, St. Louis, Knoxville, Birmingham

SULLIVAN MACHINERY COMPANY
808 Wrigley Bldg., CHICAGO

Muskogee, Duluth, Denver, Price, Utah, Salt Lake City, Spokane, Huntington, Butte, Drumheller, Alta.

The AMERICAN MINING CONGRESS "Little Exposition"

NEW—AND OF INDUSTRY-ELECT MINE

Patented January, 1929
No. 1699535

See this new a.c.f. electrically welded car, and the a.c.f. drop-bottom car at the Cincinnati Convention—Booths 51 and 52.

Besides the usual superior features that have made a.c.f. mine cars the standards of excellence for many years, these new welded cars offer such additional advantages as:

Less weight for any given capacity. No Rusting between plate connections. Less rivet heads to obstruct movement of coal.

Unnecessary weight is costly to you, not only the purchase price but each year it costs you an amount equal to or greater than the purchase price to pull it around.

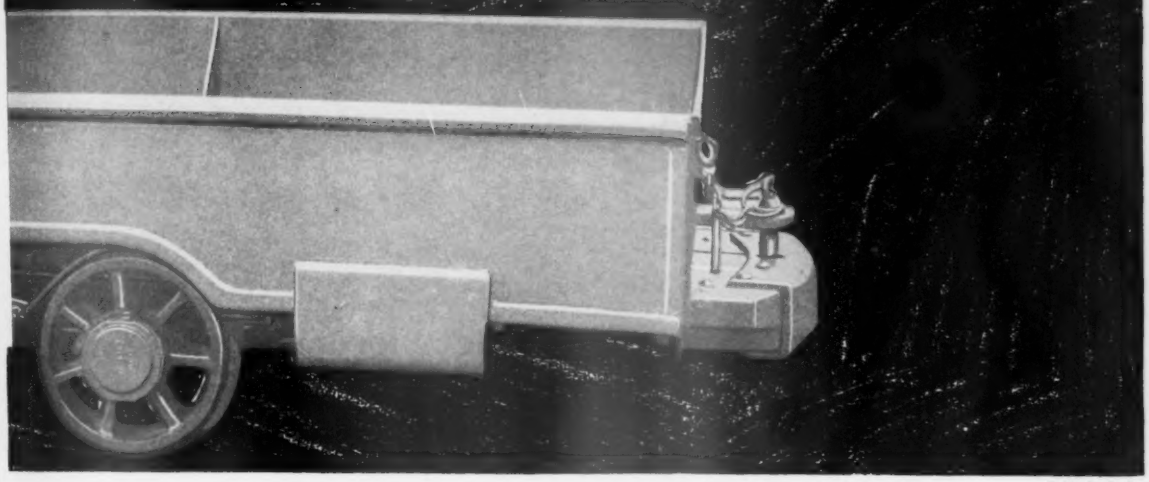
a.c.f.

AMERICAN CAR AND

New York
Berwick, Pa.

St. Louis
Bloomsburg, Pa.

INTEREST TO THE RICALLY WELDED CARS



Investigate the proven merit of a.c.f. drop-bottom mine cars for high production automatic trip dumping. Designed and built to operate at low cost. Super-strength where strength is needed. Special formula high-speed wheels that last twice as long as other wheels. Heat-treated steel axles. Timken bearings. All precisely adapted to meet the particular requirements of your own mine.

A scientific research organization, in addition to unequalled manufacturing facilities and 70 years' experience makes possible these a.c.f. quality products.

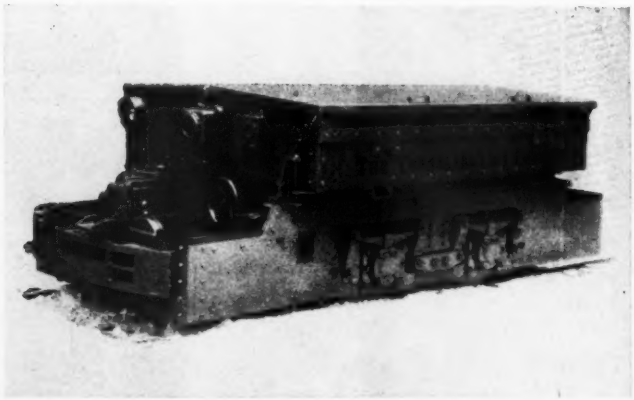
Write us your mine-car or car-wheel problems.

a.C.f.

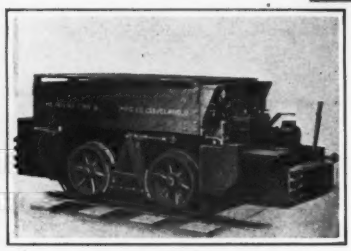
FOUNDRY COMPANY

Chicago **Pittsburgh**
Huntington, W. Va. **Terre Haute, Ind.**

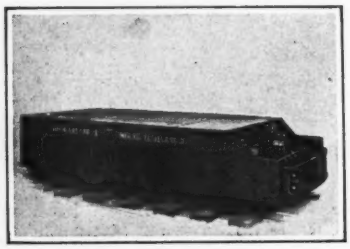
ATLAS LOCOMOTIVES



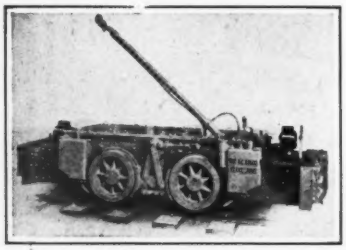
Permissible Storage Battery Locomotive



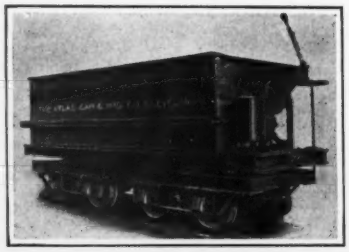
Type B. Locomotive



Type F for Low Coal



Trolley Locomotive



Slate or Refuse Larry

Reduce Haulage Costs . . .

ATLAS storage locomotives have capacity to do more work on a charge—have great overload capacity for short periods—ability to start surprisingly heavy loads and is small in size as compared to most locomotives of same rated power.

Atlas locomotives have demonstrated this economical service on many properties under severe conditions.

Write for full details.

Atlas builds a full line of haulage equipment—Storage Battery Locomotives, Trolley Locomotives, Rotary and Side Delivery Slate Larries, Scale Cars and Weighing Cars of all kinds—Atlas Indicating and Recording Scale Mechanism for weighing scales on cars and hoppers.

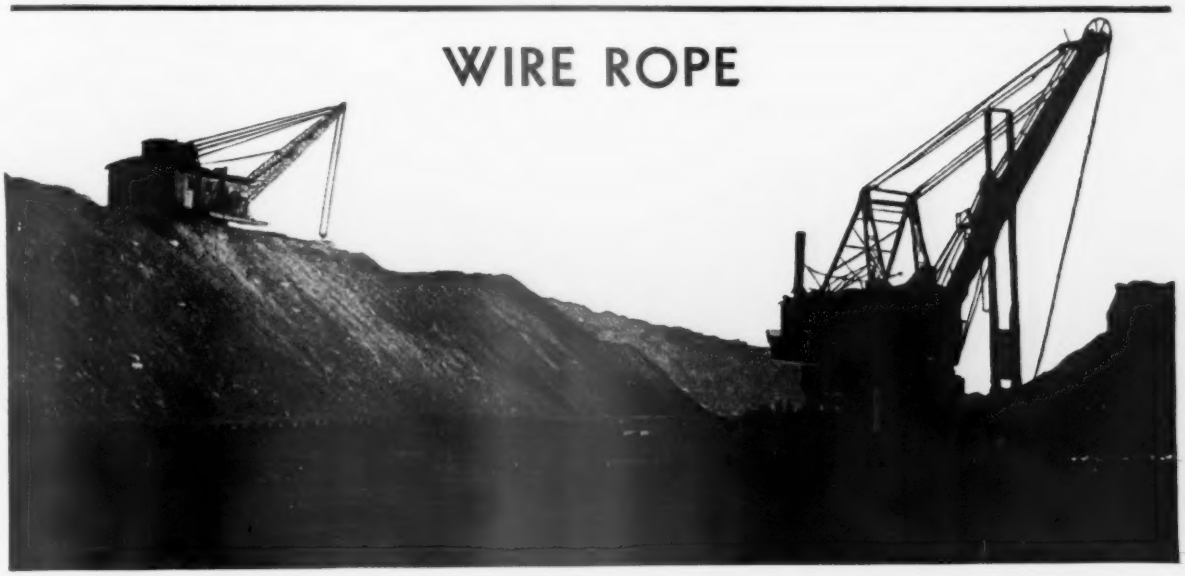
THE ATLAS CAR *and* MFG. COMPANY

CLEVELAND, OHIO

ENGINEERS—MANUFACTURERS

HAZARD

WIRE ROPE



Selectivity—the key to lower rope costs

THERE is a distinct advantage for you in buying wire rope from the company that makes a complete line. This advantage is the ability to obtain *properly designed* rope for each particular operation.

Take drag line service, for example. You need rope especially designed to withstand severe abrasion—such as Flattened Strand. Or for operations where multiple reeving is encountered, you should use Preformed Rope, designed to resist severe bending strains. And for dredging, Armored Rope is designed to resist corrosion of the inner wires.

Selection of the *properly designed* rope for each operation, is the key to lower rope costs.

From the complete Hazard line, rope buyers can obtain—and are certain to receive—the rope most suitable, and most economical, for each class of service.

There's a Hazard Rope for every class of service

FLEX-SET Preformed Wire Rope—Armored Wire Rope—Improved Flattened Strand—Mining Machine Rope—Haulage Ropes—Bear Cat Rope—and all standard constructions.

HAZARD WIRE ROPE COMPANY

WILKES-BARRE PENNSYLVANIA

New York Pittsburgh Chicago Denver Los Angeles San Francisco Birmingham

The AMERICAN MINING CONGRESS "Little Exposition"

THE NEW UNIVERSAL SHAKER LOADER

AND

Duckbill
TRADE MARK

11 PATENTS GRANTED AND PENDING IN UNITED STATES, CANADA AND EUROPE

George H. Ernsbarger, Frank L. McCarty, James V. Macdonald, the inventors of the "Duckbill."

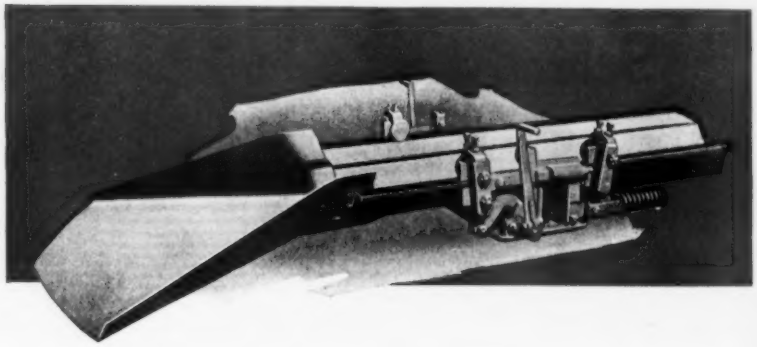
What the "Duckbill" Will Do

Eliminate hand shoveling of coal and rock. Work under apparently impossible roof conditions. Admit of cleaning the coal in the working place. Eliminate room switches and room tracks. Loads each pit car without uncoupling from trip. Works in entries, rooms and on pillars; but one type of machine. Will work in seams as low as 22 inches thick.

In the Wyoming mines of The Union Pacific Coal Company 1,774,279.65 tons of coal were loaded in 1929 by machines, of which 945,325.30 tons, or 53.4 percent, were loaded by "Duckbills."

The MacHatson Trough Fastener

Takes the place of the bolt and two nuts formerly used.
No threads to batter and strip.
No special wrench to lose in the coal.
Goes on with the tap of a hammer, off same way.
Fits Cosco, Eickhoff, Mavor and Coulson, and Flottmann troughing.
Saves time, money and your temper.



Patents Pending

The Universal Shaker Loader and "Duckbill" is designed to be attached to the inbye end of any substantially constructed reciprocating shaker trough conveyor, whether operated by electric or compressed air drive. It can be purchased direct from the Rock Springs Loader Company or from any manufacturer or distributor of jigging or shaking conveyor.

Address the Company or any of our Distributors

ROCK SPRINGS LOADER CO.

Conveyor Sales Company, Inc.
299 Broadway, New York

Eickhoff Brothers,
116 Adams Avenue,
Scranton, Pennsylvania.

Meco, Incorporated,
700 Continental Bldg.,
Baltimore, Maryland

ROCK SPRINGS
WYOMING

Sole owners and manufacturers

Peacock Brothers, Ltd.
Montreal, Canada.

The Ironton Engine Co.,
Ironton, Ohio.

The Vulcan Iron Works Co.,
Denver, Colorado.

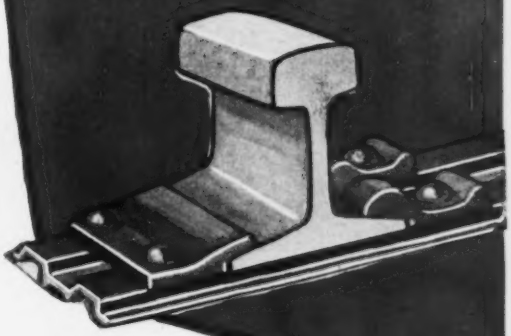
FILLING The INDUSTRY'S *Important needs*

AT THE mines of many of the world leading coal producers (names on request) you will find ample evidence of the industry's confidence in West Virginia Rail.

Rails and accessories; frogs, switches, steel mine ties, switch stands, room turn-outs, crossings, cross-overs, portable tracks—these are our products.

WE ARE not the oldest—nor the largest manufacturer of mine track equipment, but we yield to none in our endeavor to maintain an organization strong in character and technical knowledge.

Wherever there are mines, the name West Virginia Rail Company stands for quality, integrity and service.



Meet Us at the "American Mining Congress Show" Booths 9 and 10 Cincinnati May. 5-9

W.VA.RAIL

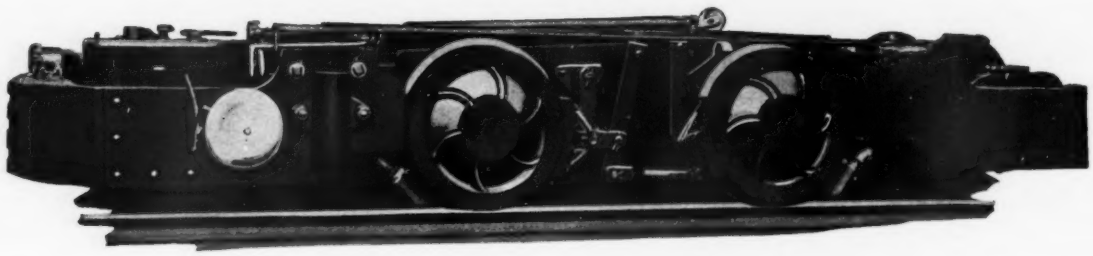
Send for your copy of Catalog "C."

WEST VA. RAIL CO.

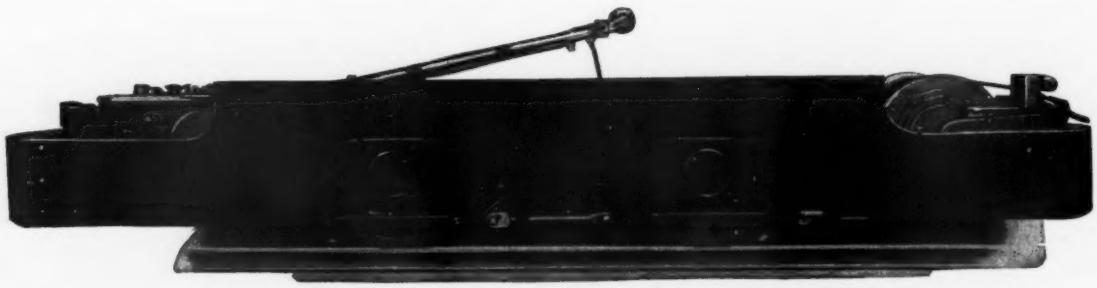
HUNTINGTON, W. VA.

RAILS, FROGS, SWITCHES, MINE TIES

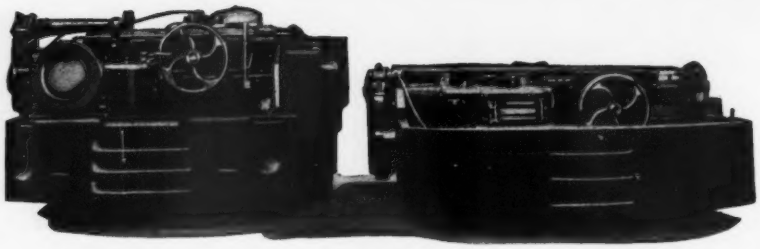
24" Low



The NEW Goodman 6-Ton Low-Vein Gathering Locomotives



24 in. Overall Height—Electric Cable Reel—Inside or Outside Frame



Standard Height — **Comparison of 6-Ton Locomotives** — **24-in. Deck Height**

The Best Features of Goodman Standard Height Locomotives are Built into this Latest Low-Vein Design.

Specifications and Features:-

SPEED—Slow or Standard.

FRAME—Rolled steel side plates, hot riveted and shouldered to heavy steel end frames—rigidity, ruggedness and assurance of perfect alignment. Supported on eight large helical springs.

EQUALIZER—The transverse equalizer consists of three working parts, all of heavy steel, placed at one pair of wheels. This feature gives the locomotive three-point support.

MOTORS—Two; interpole type. Split shells, their lower halves hanging on the axles. Mica insulated strap copper field coils. Strap copper armature coils. Bolted type commutators.

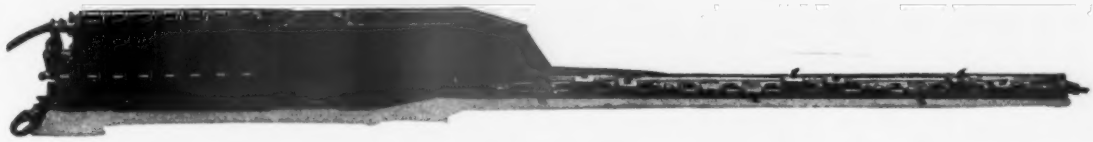
CONTROLLER—Extra large contact fingers, all alike and easily adjusted. Reel-and-trolley switch built into controller.

RHEOSTAT—Alloy steel grids; non-breakable.

GEARING—Single reduction spur gear drive.

Complete Details in Book H-302.—Ask for a Copy.

16" Low

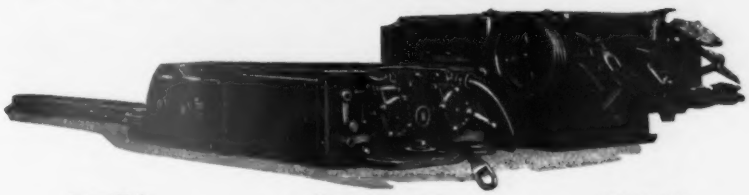


The NEW Goodman Universal Control Low-Vein Shortwall

16 in. Overall Height—A Foot Lower than the Standard Height

Constant Betterment,

founded upon correct principles of design, has made Goodman Cutting Machine leadership inevitable. Today, with almost a half century of the builder's experience back of it, the new Universal Control Low Vein Shortwall Machine is ready for you.



Low Vein Height — Comparison of Universal Control Machines — Standard Height

Men Who Know Cutting Machines Will Recognize These Features

1. **The machine makes its own bottom. No scraping required. The bottom bits are flush with the bottom of the machine.**
2. **Cuttings are rapidly discharged at the side of the machine, through an arc-shaped passageway—a patented Goodman feature. This passageway, or opening at the side, is extra large and releases the cuttings quickly and freely, without clogging, thus maintaining a minimum load on cutter chain, gearing and motor.**
3. **All movements of the machine are under variable speed control. Both head rope and tail rope drums are power driven, and both are equipped with brakes. Each drum has two speeds, and both speeds for each drum are variable.**

Built for Thin Seams

Complete Details in Book M-301.—Ask for a Copy.

GOODMAN MANUFACTURING COMPANY
HALSTED ST. at 48TH.
CHICAGO - - - ILL.

Locomotives - Loaders - Coal Cutters

PITTSBURGH-WILKES-BARRE-HUNTINGTON, W.VA.-CINCINNATI-BIRMINGHAM-ST. LOUIS-DENVER-PRICE, UTAH

(29)

The AMERICAN MINING CONGRESS "Little Exposition"

ROTARY DUMPS
CRADLE DUMPS
CAR HAULS
CAR RETARDERS
AUTOMATIC GATES
AUTOMATIC SWITCHES

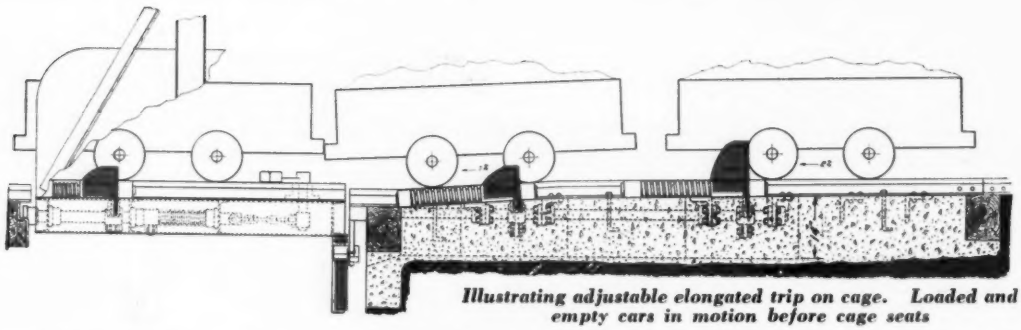
1910 PATENT 1930
NOLAN
MINE CAR CONTROL DEVICES

CAGERS
CAGE LOCKS
CAGE LANDERS
DUMP FEEDERS
MANUEL CAR STOPS
KNUCKLE SAFETIES

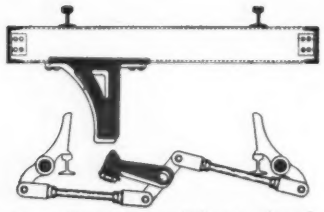
Cage In Two Seconds

with a Nolan "Preadmission" Cager

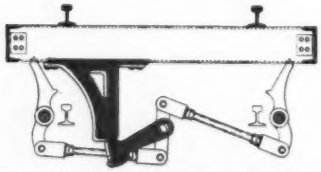
and with 1 to 4 fewer men



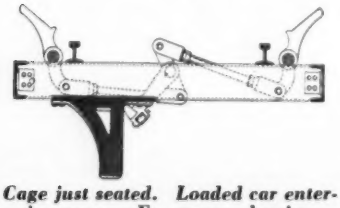
Illustrating adjustable elongated trip on cage. Loaded and empty cars in motion before cage seats



Cage dropping and horns closed



"Preadmission" leg engaging trip, horns open. Car moves forward



Cage just seated. Loaded car entering cage. Empty car leaving

Dependable equipment since 1909. Designed to withstand the severe requirement of mine usage.

—**SPEED:** Cars caged in 2 seconds. No delay. Faster than the top.

—**CUSHION:** Horns cushioned with long compression springs to absorb shock.

—**STRENGTH:** To suit the trip. Extra heavy ones are now built with 3" and 3½" shafts and castings to meet varying conditions.

—**ANCHORAGE:** Anchored in concrete, *no Nolan ever moves.* Steel angles bind rails together. Full steel foundation is provided when desired.

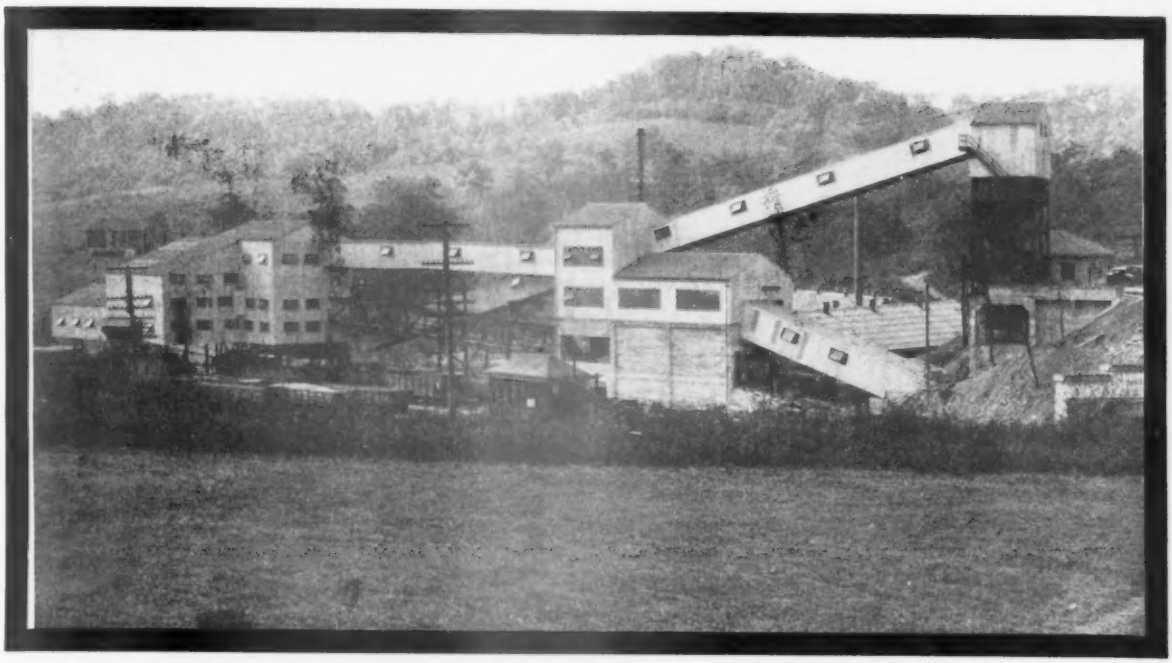
—**SAVINGS:** One to four fewer men necessary. Tonnage greatly increased with a reduced force.

Let us show you some of the remarkable records established by Nolan "Preadmission" Cagers. Write.

THE MINING SAFETY DEVICE CO.

Bowerston, Ohio

The AMERICAN MINING CONGRESS "Little Exposition"



The above: Butler Consolidated Coal Co. mine (featured in this magazine), was designed and built entirely by the Allen & Garcia Company.

"Specialized engineering is solving the 'future of the coal mining industry'"

In the present era of "definite product" coal mining the question of preparation methods and preparation equipment is becoming of outstanding importance to the coal mining industry.

In this as in other branches the Allen & Garcia organization is equipped to render the coal mining company expert service. The preparation of modern markets calls for a practice that approaches "manufacturing" methods and "A & G" can bring to the specific problem both experience and knowledge.

On the A & G staff are also specialists in underground development and mechanization; electrification; appraisals; wet or dry coal cleaning processes; hoisting and haulage systems, etc.

Uniformly successful results are being obtained at mines which have availed themselves of the A & G service. Thus is specialized mining engineering aiding to solve "the future of the coal mining industry."

ALLEN & GARCIA COMPANY

332 South Michigan Avenue, Chicago, Illinois

Pittsburgh Office:
8 Market St.

Birmingham Office:
711 N. 9th St.

ALLEN & GARCIA

ENGINEERS AND BUILDERS
DESIGNING · CONSULTING CONSTRUCTING · TIPPLES · WASHERIES

OF MODERN COAL OPERATIONS
COMPLETE PLANTS · POWER PLANTS · ELECTRIFICATION · REPORTS · APPRAISALS

Recent EDISON LAMP *Installations*

ALABAMA BY-PRODUCTS CORPORATION
Birmingham, Alabama
Bradford, Dixiana, Gamma and Majestic Mines

AMERICAN ROLLING MILL COMPANY
Nellis, W. Va.—Nellis Mine

BUTLER CONSOLIDATED COAL COMPANY
Wildwood, Penna.
Wildwood Mine

FORD COLLIERIES CO.
Curtisville, Penna.
Francis and Bery Mines

HADDOCK MINING CO.
Wilkes-Barre, Pa.
Candlemas Colliery
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HAYDEN BROTHERS COAL CORPORATION
Denver, Colorado
Hayden Mine

LEYDEN LIGNITE COMPANY
Denver, Colorado
Leyden Mine

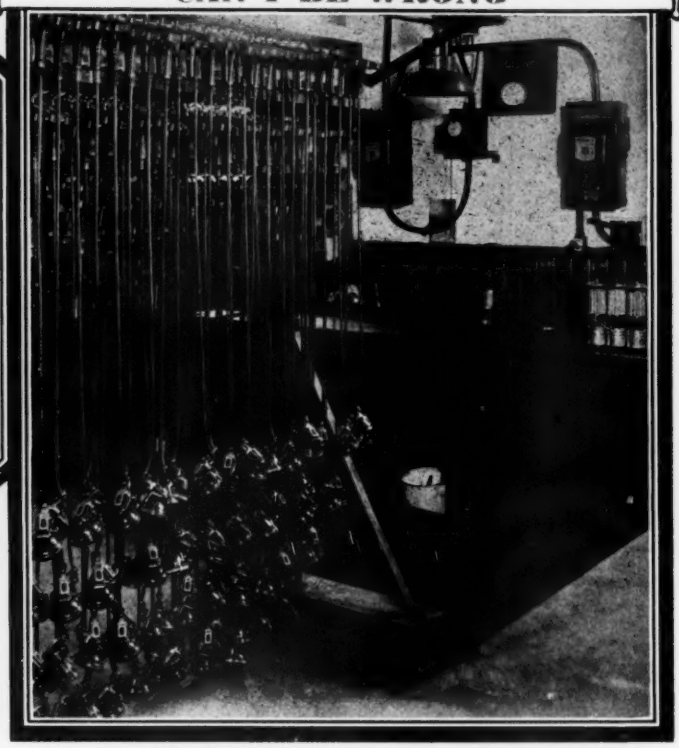
LINCOLN GAS COAL CO.
Pittsburgh, Pa.
Lincoln Mine

MILBURN BY-PRODUCTS COAL COMPANY
Milburn, W. Va.
Milburn Mine

WOODWARD IRON CO.
Woodward, Alabama
Mulga and Dolomite Mines

See the EDISON Display at the American Mining Congress
Visit M-S-A Booth 126

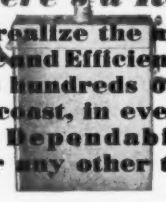
HUNDREDS OF MINE OPERATORS *CAN'T BE WRONG*



More Than 400,000 EDISON MINE LAMPS Have Been Sold to the Mining Industry!

Hundreds of Mine Operators throughout the United States, Canada and Mexico have standardized on EDISON MINE LAMPS... In fact, nine out of every ten electric cap lamps used in the mines of North America are Edisons.

There's a Reason...



Mine owners realize the many benefits to be derived from Safe and Efficient EDISON Illumination. Moreover, the hundreds of EDISON Installations from coast to coast, in ever increasing numbers, testify to the Dependability and Economy of EDISONS over any other type of portable, mine lighting.

Have you ever considered the advantages of an EDISON Equipped Mine? Let us tell you about Mr. Edison's Newest Lamp—the Model H. Write for Bulletin No. 14.

Hundreds of Mine Operators Can't Be Wrong

Mine Safety Appliances Co.

Braddock, Thomas and Meade Sts., Pittsburgh, Pa.

"Everything for Mine and Industrial Safety"

A Wire Rope that Makes for Economy

Dependability in wire rope means increased economy, for a heavy toll is taken every time a replacement is necessary.

"HERCULES" (Red-Strand) Wire Rope is dependable because it is made of acid open-hearth steel wire, and every wire put into it is first rigidly tested by us to make sure that it meets our exacting requirements as to strength, toughness, flexibility and wearing qualities.

If you want a safe and economical wire rope for use on stripping shovels, mine hoists, inclines or mining machines, give "HERCULES" a chance to show you what it can do. Its performance record is continually making and holding friends.

WHEN conditions do not permit of economical surface transportation, a Leschen Aerial Wire Rope Tramway is the practical solution. Especially efficient for handling mine waste.

Write for complete information.

Send for Catalog No. 37

Made Only by **A. Leschen & Sons Rope Co.** Established 1857

5909 Kennerly Avenue

ST. LOUIS, MO.

New York Chicago Denver San Francisco

Visit Us At Booth No. 146, American Mining Congress

The AMERICAN MINING CONGRESS "Little Exposition"

DISLODGING COAL *at the* WORKING FACE

CARDOX

A Permissible Blasting Device

The approval of the mining industry is the recommendation we set forth for the CARDOX method.

The quality of safety in blasting methods is the chief reason for CARDOX. The economic advantages of low pressure blasting with CARDOX follow closely in importance.

CARDOX produces less breakage into fine sizes and permits less breakage in handling. The result is better coal, produced in a safer manner with a favorable economic balance of cost and realization.

See CARDOX *at Booth* 46 *at the Cincinnati exposition*

SAFETY MINING COMPANY

307 North Michigan Avenue — CHICAGO

The AMERICAN MINING CONGRESS "Little Exposition"

THE WHALEY "AUTOMAT" COAL LOADING MACHINE

(PATENTS APPLIED FOR)

See the New "Automat"
At Booths 6-7
Cincinnati

The Whaley "Automat"

[1]

For long years the Myers-Whaley, well and favorably known,
Set the standard of performance, did its work, and gained renown.
Sturdy in its working members, very human in its motion,
Shoveled it like many devils, many yards of muck its portion.
Into rock or ore or coal, ate its way and asked no quarter,
Ton a minute and some more, all it did and did not falter.
Duty heavy—day and night; pushing always, records set,
Tonnage loading, entry driving, tunneling, all that you bet!
Pioneering as it did; setting paces all its own,
Competition soon was stirring, pushing, crowding for the crown.
Twenty years and more it led, all endeavor in its field,
Is in heavy work still leading, and in this it shall not yield.

[2]

Loading coal in mines below, first, and easiest, of its tasks,
Has invited competition, greater speed secured at last.
So that now the Myers-Whaley needs a brother of its own,
Which, maintaining the tradition, shall its competition down.
Hence, upon the scene there cometh, new conception, tested, tried,
The Whaley Automat, the shovel, of exceeding worth and pride.
Having in its constitution rugged features of its brood,
Without waste or idle motion, every stroke it takes a load.
Many strokes it makes per minute, with a shovel short and wide,
Filling full the broad conveyors moving at a steady stride.

[3]

In and out the cars are flitting, ever faster comes the coal,
And the miners in amazement see it passing every goal.
Places cleaned up in a hurry, come on let us get some more,
And again the coal is moving, as it never moved before.
So it is, from hour to hour, day by day, the tonnage grows,
And the Automat is proving in endurance, strength and speed,
Far ahead of any loader in this chosen special field,
And a true and worthy brother to the heavier slower motion
Of the Myers-Whaley Shovel, which for heavier, harder duty
Loading rock and ore and muck, still its own is holding ever;
So my friend, let us advise you which of these will serve you better.

[4]

If in tunnel, rock or ore mine is your task,
Take the Myers-Whaley Shovel, nothing better could you ask.
If in loading coal for tonnage, hard or soft, thick or thin,
The Automat's your weapon, use it rightly and you'll win,
All advantage of production at the lowest cost of tin.
Now my tale I've told you partly of this new and wondrous loader,
But this fact, just please remember, that the shovels of my song
Are much better than my verses—in mechanics we are strong.

The above verses are dedicated to
Progress in Mechanization of Coal Mines.

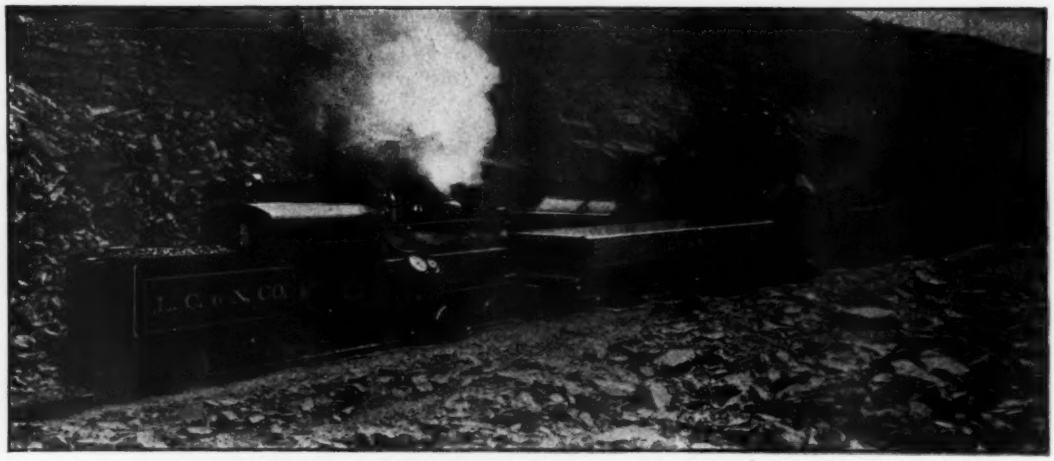
3-6-30 WILLIAM WHALEY

MYERS-WHALEY CO.

INCORPORATED

KNOXVILLE : TENN., U. S. A.

The AMERICAN MINING CONGRESS "Little Exposition"



This photo shows one of the 55-ton Heislers used on the Lehigh Navigation Coal Co.'s Summit Hill stripping near Lansford, Pa.

Strip-pit operators tell of *hauling at least 30% more* with HEISLERS

When you hear about a new locomotive that is hauling much more than any other engine around the mine—you can depend on it's being a HEISLER! The engine that has set a new standard for low-cost mine hauling.

For example, Lehigh Navigation Coal Company's HEISLERS have done better than their guarantee—which is to haul *at least* 30% *more* than a rod engine of the same weight. In some cases the HEISLERS hauled 100% heavier loads.

And on the world's largest bituminous stripping, Fidelity Mine of United Electric Coal Companies, the HEISLERS have made a similar improvement.

Preferred for its Bigger Capacity and *greater speed*

20% to 25% faster acceleration with the HEISLER—easy to start a train from a dead stop up to the load limit.

It spots cars accurately at the loading shovel—saves shovel time — keeps costs down to a new low minimum.

Perfect brake control on the steepest grades.

And the HEISLER's free-swiveling trucks enable it to negotiate sharp curves easily, *delivering its full hauling power.* On rough temporary track, every wheel of the HEISLER is held in contact, doing its share of the driving. *Lower track maintenance—less wear on rails.*

It will pay you to investigate this powerful locomotive — *the recognized choice of leading operators today.* Get the facts and figures on HEISLER performance, at Booth 109-A, Cincinnati Convention.

HEISLER LOCOMOTIVE WORKS
Erie, Pa.

HEISLER
GEARED LOCOMOTIVES
Steam, Gas-Electric, Diesel-Electric

164

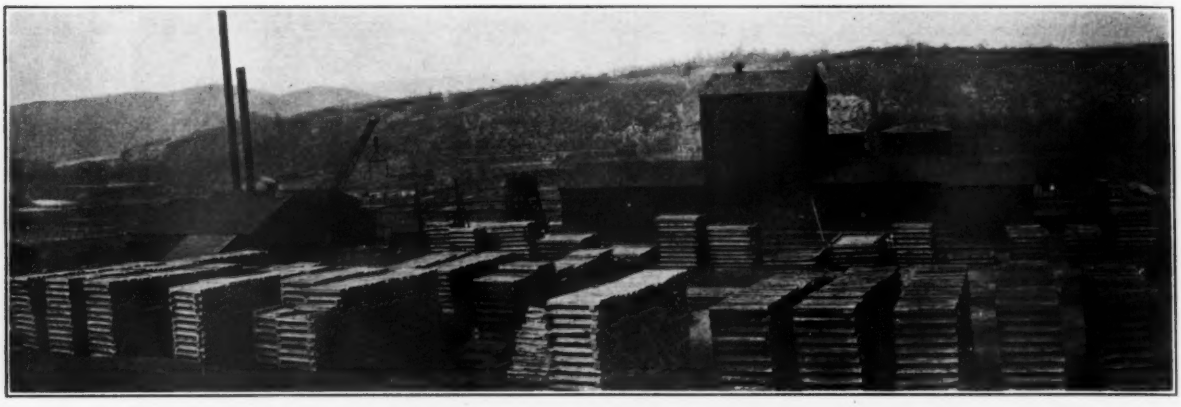
One of 6 Heislers on the largest stripping in the world—at the new United Electric Fidelity Mine. Note the big Marion "6600" shovel in the background. On all of the Heisler-equipped United Electric operations, two Heislers per unit are used, additional locomotives being unnecessary.

The COLODER Company

Columbus, Ohio, U.S.A.

568 North 4th Street

The AMERICAN MINING CONGRESS "Little Exposition"



Mine Ties Seasoning on a "Century" Yard

Treated Mine Ties and Timbers will last indefinitely

Why throw your money away for untreated ties and timbers when you know they will have to be replaced in a very few years?

We will furnish treated materials or—

We will treat your ties and timbers

CENTURY WOOD PRESERVING CO.

OFFICES:

17th Floor, Koppers Bldg., Pittsburgh, Pa.

6th Floor, Chamber of Commerce Bldg., Boston, Mass.

10th Floor, Finance Bldg., Philadelphia, Pa.

30 Church Street, New York, N. Y.

OPERATING PLANTS:

Delaware Wood Preserving Co., Newport, Del.

The Maryland Wood Preserving Co., Hagerstown, Md.

Michigan Wood Preserving Co., Reed City, Mich.

New England Wood Preserving Co., Nashua, N. H.

The Ohio Wood Preserving Co., Orrville, Ohio

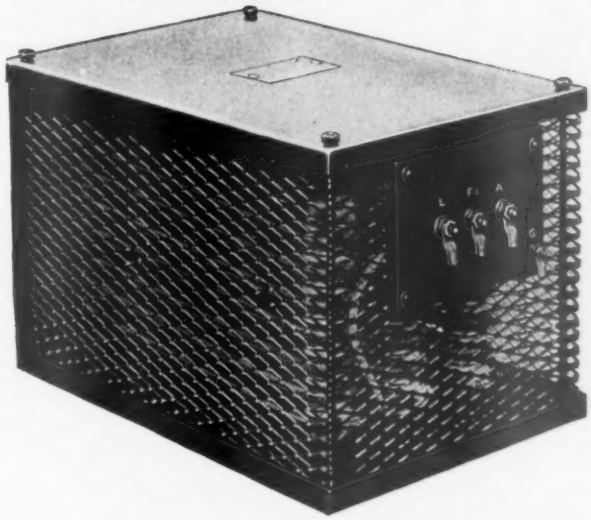
Pittsburgh Wood Preserving Co., Broadford Junction, Pa.

The AMERICAN MINING CONGRESS "Little Exposition"

More Tons Per Day With A P-G Homanite Steel Grid

90 Days Free Trial to Any Responsible Company

Reduce Time and Effort With A W-W Mine Duty Self Starter



For Direct Current Motors

Here's the best time and labor saver you've seen in years. It will do the work of one man, night and day, increase production and cut running expenses.

It is built of wire coils of a special alloy, with a high temperature co-efficient of resistance. Coils are wound on complete units and arranged in series parallel for the different voltages and horsepower.

Don't delay progress! Whether the job is close at hand or a mile away—the W-W Starter will give you greater satisfaction in every detail.

A big investment in equipment is frequently tied up when ordinary grids fail in service. This is what Post-Glover Grids can help you overcome—wherever grid resistances are needed.

Your electrical department will know what it means to have a grid that doesn't break, is not affected by vibration, won't warp, nor bridge to cause short circuiting and premature armature roasting. Post-Glover Steel Grids frequently outlast eight to ten ordinary grids.

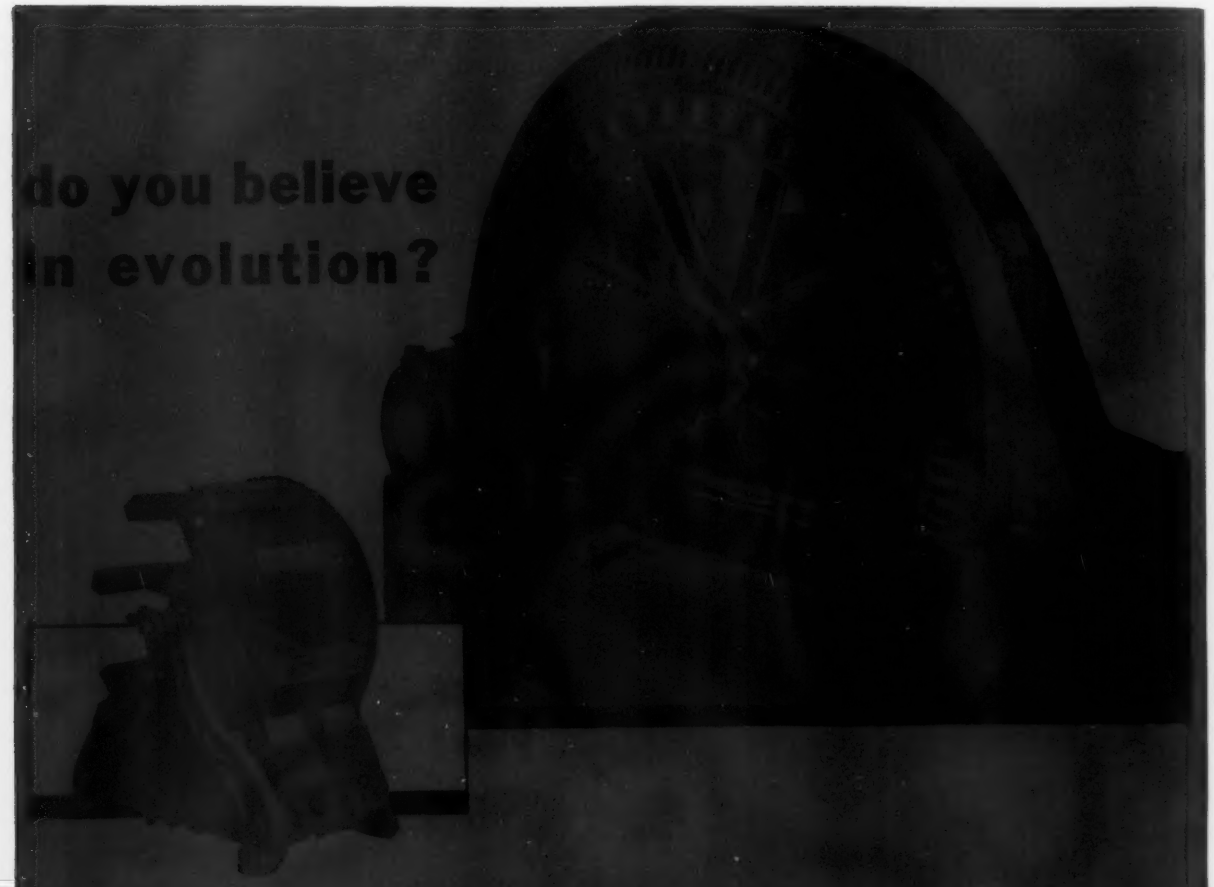
All P-G grids are sold with a definite guarantee of twelve months service. Any breakdown within that period will be made good without question and at our expense. A life of five or six years is not unusual for our resistances, and we recently came across a stack that had been in continuous operation for ten years.

May we send a trial resistance entirely at our own expense—90 days time for you to watch it on your toughest problem!

We Invite You to Visit our Booth No. 66

THE POST-GLOVER ELECTRIC COMPANY

221 West Third Street - - - Cincinnati, Ohio



EVER SINCE 1874, when the Bastet Magnetic Engine appeared, designing engineers have been developing bigger and better motors. The basic principles embodied in the early designs have been applied more efficiently. New methods of construction have been adopted. The rugged, welded frame, synchronous motor, 10,000 times more powerful than its little forerunner, symbolizes this evolution. Many steps in this record of progress may be attributed to the development and constant improvement of National Pyramid Carbon Brushes.

The synchronous motor of today is the last word in efficiency. Maintenance has been reduced to a minimum. The load current reaches the stator windings without moving contact and only the direct current excitation of the revolving field is carried by the brushes and slip rings. But the selection of the proper brush grade is important. The ring surface must be kept well polished, free from spots or undue wear.

This, like the many other brush problems arising through the years, has been successfully solved by the unsurpassed research facilities of National Carbon Co., Inc. Electrical industry has presented thousands of cases for carbon brushes and a National Pyramid Brush has been available for each use.

* * *

The Eveready Hour, radio's oldest commercial feature, is broadcast every Tuesday evening at nine (New York time) from WEAF over a nation-wide N. B. C. network of 30 stations.

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation

Carbon Sales Division — UNION CARBIDE AND CARBON BUILDING — Cleveland, Ohio

Branch Offices and Factories

The AMERICAN MINING CONGRESS "Little Exposition"

Wherever backs bend low—

LORAIN

SECTIONAL CONVEYORS

Back-breaking seams . . . men working on their knees . . . shoveling coal into face conveyors . . . main conveyors snatching the load . . . delivering speedily into cars . . . greatly increased production per man employed . . . better prepared, lumpier coal. This is a quick description of what LORAIN Portable Face Conveyors and Sectional Conveyors are doing in mines where rapid working is imperative and "wherever backs bend low."

Let us study your problem—we are glad to make recommendations and give quotations on these simple, light, low, strong, durable, reversible Conveyors. Other quality items in the LORAIN line of mine equipment are:- Mine Cars, Mine Trackwork, Collapsible Roof Jacks, Timber Jacks.

THE LORAIN STEEL COMPANY

JOHNSTOWN, PA.

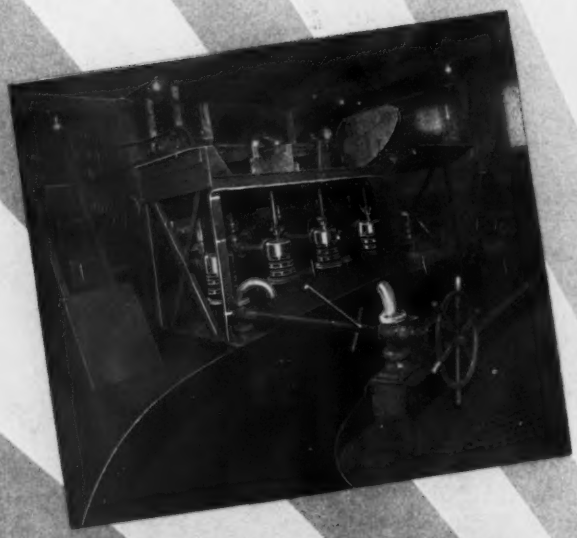
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES OF UNITED STATES STEEL CORPORATION:

American Bridge Company	Carnegie Steel Company	Illinois Steel Company	The Lorain Steel Company
American Sheet and Tin Plate Company	Cyclone Fence Company	Minnesota Steel Company	Tennessee Coal, Iron & R. R. Company
American Steel and Wire Company	Federal Shipbuilding and Dry Dock Company	National Tube Company	Universal Atlas Cement Company

Pacific Coast Distributors—United States Steel Products Co., Columbia Department: San Francisco, Los Angeles, Portland, Seattle, Honolulu. *Export Distributors*—United States Steel Products Co., New York City

Complete Equipment for Preparing and Screening



BEFORE Link-Belt recommends equipment, a careful study of all FACTS entering into the ultimate success of the installation, is made.

Our recommendations are further enhanced because — Link-Belt builds a complete line of equipment for the handling,

SEE OUR EXHIBIT...

LINK-BELT

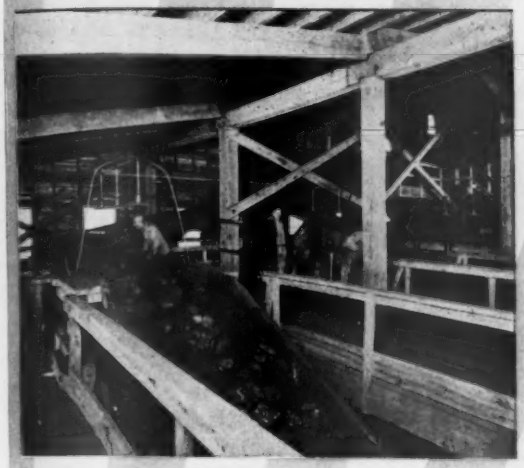
Leading Manufacturers of Equipment for Handling Materials

CHICAGO . . . 300 West Pershing Road
PHILADELPHIA 2045 W. Hunting Park Ave.
INDIANAPOLIS . 300 South Belmont Ave.
PITTSBURGH . . . 434 Seventh Ave.
WILKES-BARRE 826 Second Nat'l Bank Bldg.

LINK

The AMERICAN MINING CONGRESS "Little Exposition"

the Handling, Washing, of Coal at the Mine . . .



washing, preparing and screening of coal at the mine.

Therefore our recommendations are unprejudiced, and the result to you is an installation that will meet the requirements of your mine, operating at the highest efficiency. Write to our nearest office for full information.

Cincinnati, May 5th to 9th

COMPANY

Mechanically and for the Positive Transmission of Power

BELT

BIRMINGHAM	229 Brown-Marx Bldg.
ST. LOUIS	3658 Olive St.
KANSAS CITY	1002 Baltimore Ave.
DENVER	520 Boston Bldg.
SEATTLE	820 First Ave., South

The AMERICAN MINING CONGRESS "Little Exposition"

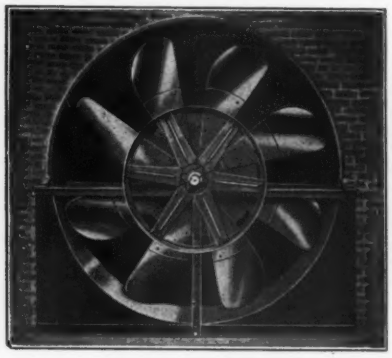
FREE INSURANCE

and

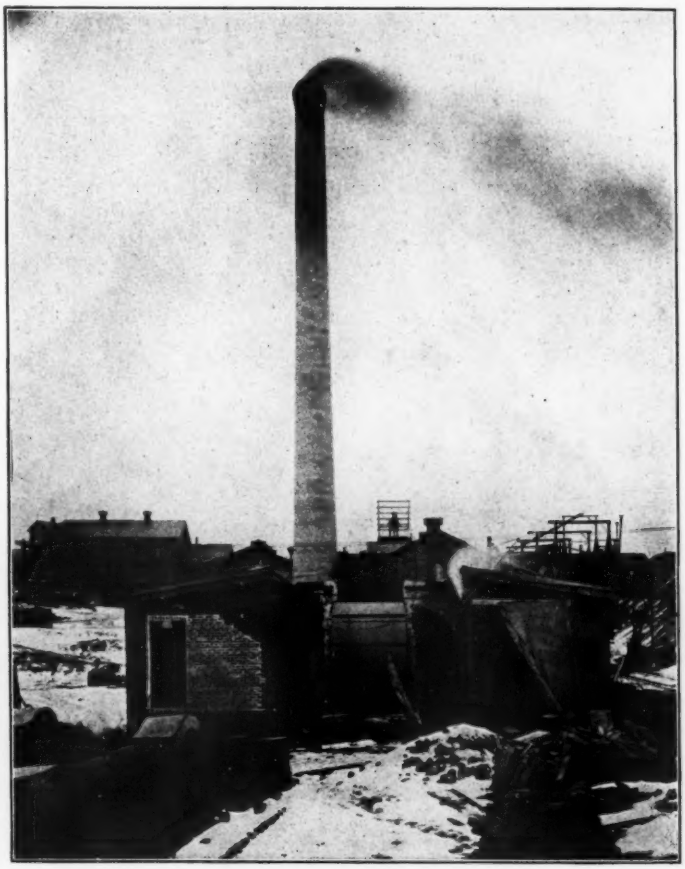
INCREASED PROFITS

are obtained when using Robinson Fan Equipment

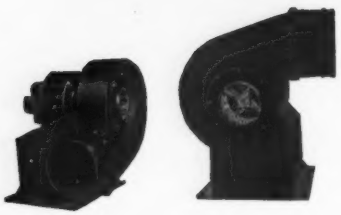
Robinson Custom Built Fans are designed to suit your particular mine conditions. They are designed to suit these conditions over a wide range of pressure caused by accumulation of water and debris in your air courses. With every Robinson Fan is furnished Robinson Ventilation Engineering Service.



The Robinson Disc Fan ruggedly constructed to operate without repairs



New Robinson Backward Curve Fans can be installed in your old fan setting. The above illustration shows what can be done to make your old fans efficient.



The Robinson Tubing Blower used for auxiliary ventilation

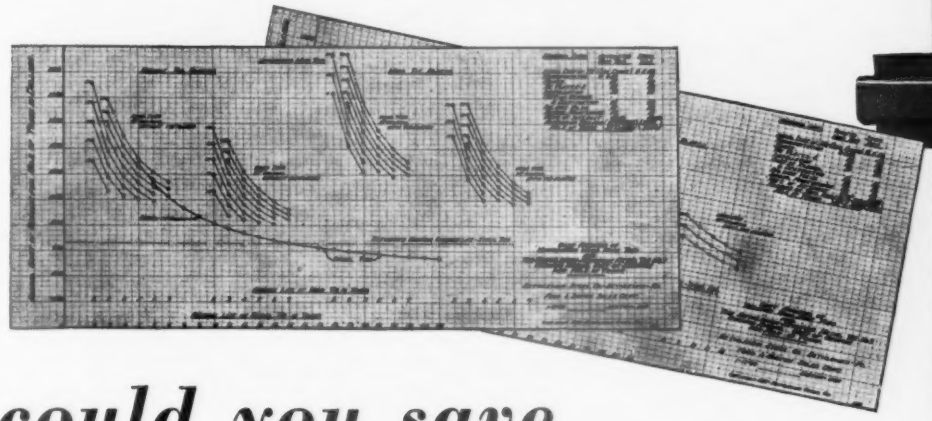
Being fan specialists we are prepared to furnish you fan and blower equipment for every purpose.

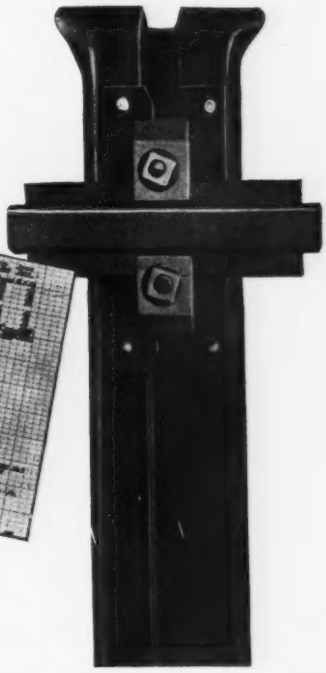
Fans for mines, brick kilns, buildings or industrial plants, induced or forced draft, tubing blowers, kiln koolers and man kooling fans, portable or stationary, turbine pressure blowers, mechanical roof ventilators.

ROBINSON VENTILATING CO. Zelienople, Pa.

The AMERICAN MINING CONGRESS "Little Exposition"

How much





could you save with these steel ties

THE comparison of wood ties with the Bethlehem (Keystone) Steel Tie No. 9 as shown in the above charts brings out clearly the economies to be had through the use of this steel tie. The charts show the annual cost of service per mile of track for untreated and treated wood ties, and for the Keystone Steel Tie.

The slight additional first cost of Keystone Steel Ties as compared with the cost of the most approved types of wood ties, is much more than offset by their far longer life. Keystone Steel Ties do not rot or decay after a short period of service, neither do they become spike-killed. They continue to give new-tie service for their full life, which is much longer than the life of wood ties. Further, due to their steel construction, they hold the track in alignment and true to gage, greatly reducing derailments.

These charts enable you to readily check your present cost of wood ties per mile of track against the cost with Keystone Steel Ties. A set of these charts will gladly be mailed on request.

CONSTRUCTION: The Bethlehem (Keystone) Steel Tie No. 9 is channel-shaped with a deep, depressed rib running through the center and a heavy, reinforcing bulb on the bottom of the sides. Ends are depressed and flared in the shape of a "whale-tail," giving the tie a firm grip on the ballast and preventing lateral motion of the track. Rolled-steel tie plates are riveted to the tie, resulting in solid one-piece construction. The tie plates have two slots, one on each side of the rail, which accommodate bolt and clip assemblies that hold the rails securely in place. Rail clips are made of heavy rolled-steel, shaped to fit over the rail base and have a heavy lug on the bottom which fits into a slot in the tie plate. Clips are held in place by a heavy bolt and Unit Lock Nut. Fastenings are applied or removed from the top without disturbing the tie or the ballast. A wrench is the only tool required.

BETHLEHEM STEEL COMPANY

General Offices: Bethlehem, Pa.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis

Pacific Coast Distributor: Pacific Coast Steel Corporation, San Francisco Los Angeles, Portland, Seattle, Honolulu

Export Distributor: Bethlehem Steel Export Corporation, 25 Broadway, New York City

BETHLEHEM

Keystone Steel Tie No. 9

The AMERICAN MINING CONGRESS "Little Exposition"

« « « MORE TON MILES AT LESS COST » » »

ELIMINATING INTERNAL STRAINS TO BEAR EXTERNAL STRAIN . . . .

Treads on Eureka Wheels are chilled to a predetermined uniform depth proportioned to the design and the service—which resists wear. The outer edge is left soft—which resists breakage.

Chilling alone is not enough . . . strength must be restored by proper annealing. All Eureka Wheels are annealed from 72 to 96 hours, eliminating internal strains, fitting the wheels for long and faithful service that will yield more ton miles at less cost. The next time you need wheels—let Hockensmith quote.

Our Booths at the Exposition will be Numbers 60 and 61—stop and see us.

HOCKENSMITH WHEEL & MINE CAR CO.

Penn, Pa. Long Distance Phone, Jeannette 700

SALES REPRESENTATIVES

Huntington, W. Va.—Huntington Supply & Equipment Co. Knoxville, Tenn.—Webster & Co.
Clarksburg, W. Va.—Mr. Norman Strugnell Chicago, Ill.—W. W. Baker, 140 So. Dearborn St.

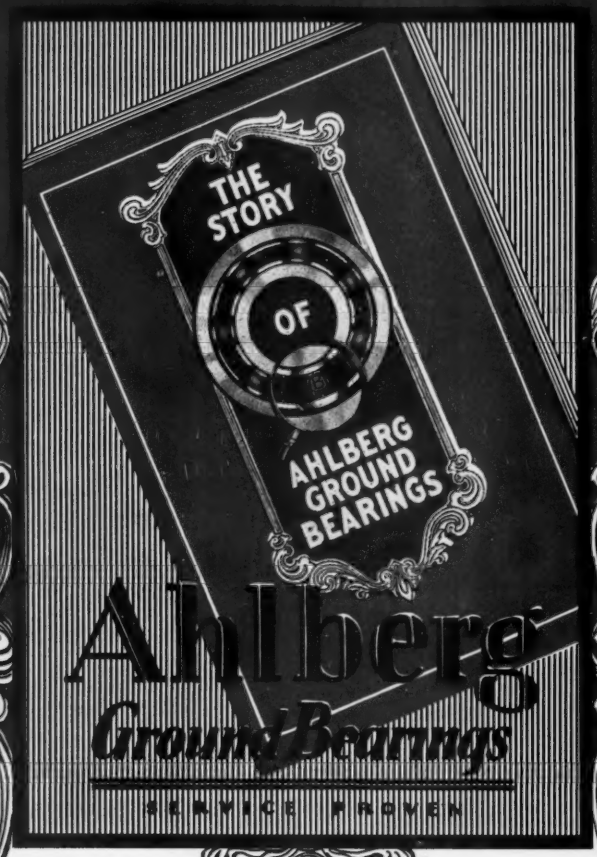
"Blue Center" Steel Wire Rope

Wherever Heavy Duty is Encountered——————

there you will find Roebling "Blue Center" Steel Wire Rope demonstrating its superiority. It is tough, flexible, uniform, durable and *amazingly strong*, possessing all the characteristics which enable it to withstand the severe punishment which wire ropes receive in the mining industry. In the 45 foot coal vein pictured below, the powerful shovels are equipped with Roebling "Blue Center" Steel Wire Rope. Its long life in service makes it the most economical wire rope to buy, as discriminating mining operators have learned that the true cost of a wire rope is not the price per foot, but the price per foot of service obtained.

John A. Roebling's Sons Company,
Trenton, N. J.

Roebling



At the Cincinnati Convention

Booth 67

If attending the congress drop in and talk over your equipment maintenance problems...are you already enjoying the 40 per cent saving in ball bearing replacement cost which the use of AHLBERG GROUND BEARINGS offers you? .... If not, arrange for it through the nearest Ahlberg Bearing Company branch or one of the following distributors:

BECKLEY MACH. & ELEC. CO.
Beckley, W. Va.

KIELEY ELECTRIC COMPANY
Cincinnati, Ohio

MINE SERVICE COMPANY
Lothair, Ky.

MONONGAHELA SUPPLY CO.
Morgantown, W. Va.

MOSEBACH ELEC. SUPPLY CO.
Pittsburgh, Penna.

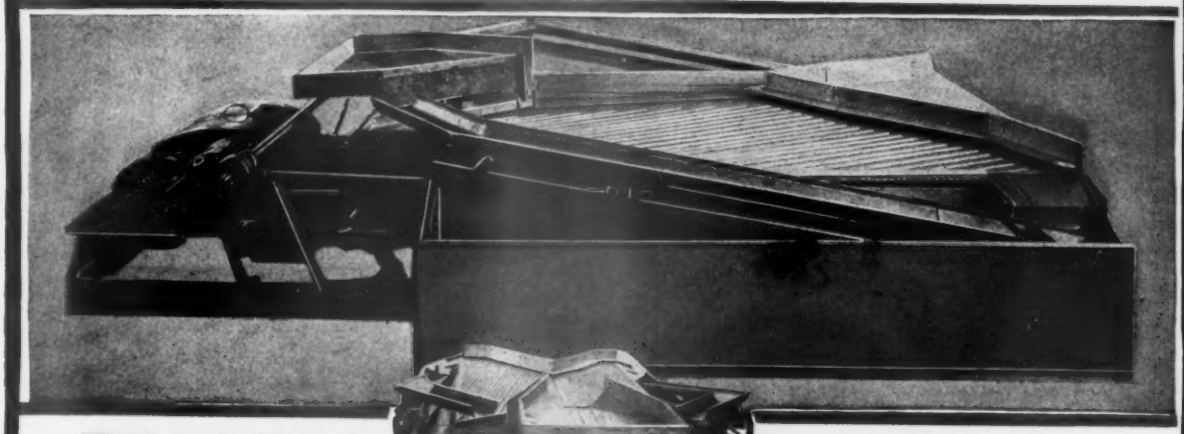
NORTON SUPPLY & EQUIP. CO.
Norton, Va.

REAMS HARDWARE COMPANY
Middlesboro, Ky,

ROGAN & ROGAN
Middlesboro, Ky.

W. L. RICHARDS
Deposit & Savings Bank Bldg., Wilkes-Barre, Pa.

By this Mark... You Will Know Them!



THIS is the New and Improved "R" Type AMERICAN Pneumatic Coal Separator which will be shown for the first time at The American Mining Congress Convention in May, Space 45. With a deck 72" x 144" it will treat twice the capacity with the same efficient results as the old "Y" Type Separator. This new AMERICAN is the last word in the development of modern and efficient Pneumatic coal cleaning equipment. A real feature of the 1930 Exposition.

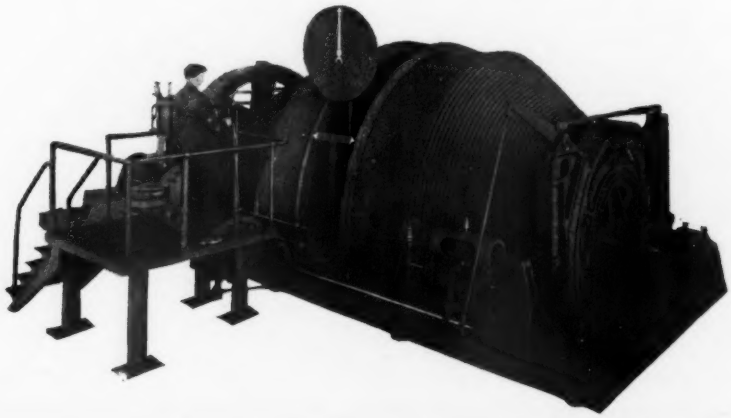
ONE of the improved features of this Separator is a "chute" on each side of the table through which the intermediate product is returned for retreatment, thus eliminating the necessity of elevator and conveyors.

Once more, AMERICAN shows the way and once again the AMERICAN Eagle spreads its wings.

Be sure to see this new development in Pneumatic coal cleaning at Cincinnati or write us for further information.

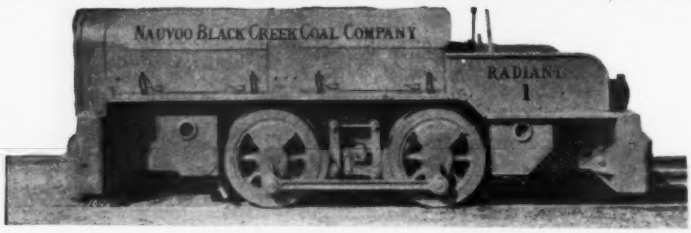
AMERICAN
(Sutton, Steele & Steele Patents)
COAL CLEANING CORPORATION
WELCH, W. VA.

The AMERICAN MINING CONGRESS "Little Exposition"

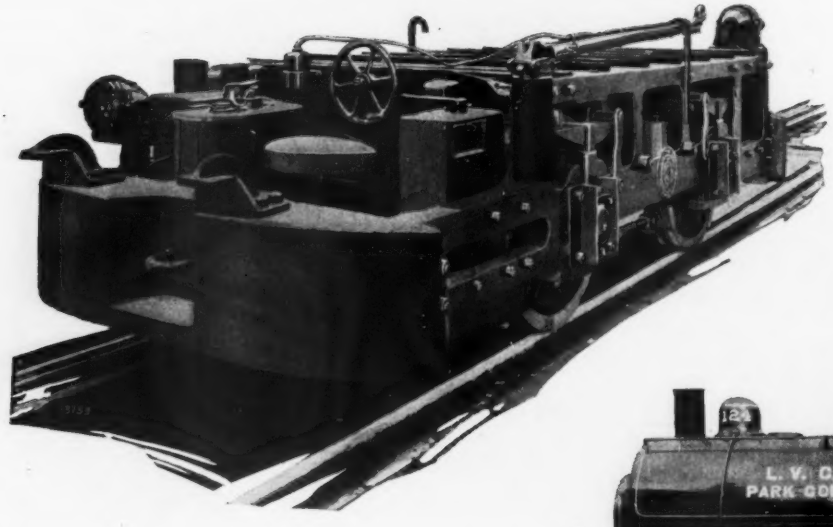


Vulcan hoists are made in all sizes from portable room hoists up. Hoist shown is 500 H.P. for 2,000 foot shaft, 8' to 14' dia. drums. Built for Mitsubishi Goshi Kaisha, Hashima Shaft, Japan.

VULCAN

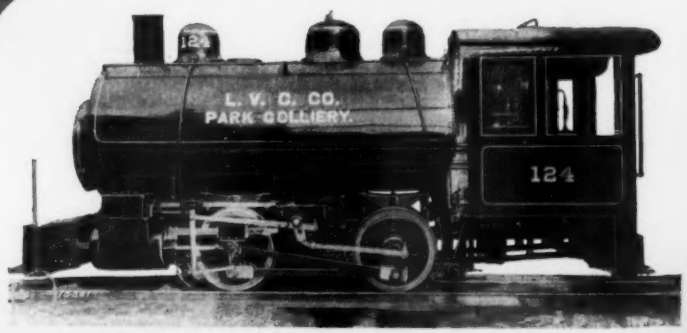


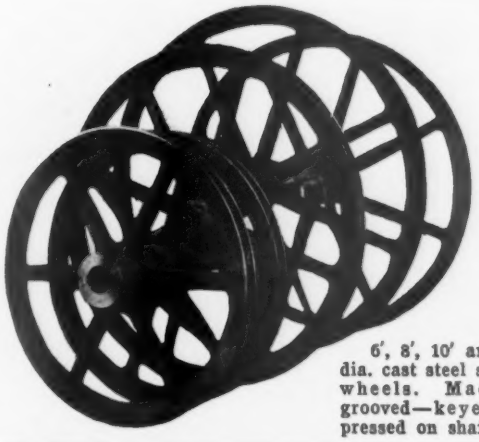
8 ton, worm gear drive, 42" gauge, mine type gasoline locomotive. Built to meet all requirements—especially valuable for intermittent service.



10 ton electric trolley locomotive. Bulletins illustrate the many Vulcan electric locomotives and describe how three point suspension is maintained.

30 ton steam locomotive, 13" x 18" cylinders, equipped with Walschaert valve gear. Vulcan steam locomotives are used all over the world.

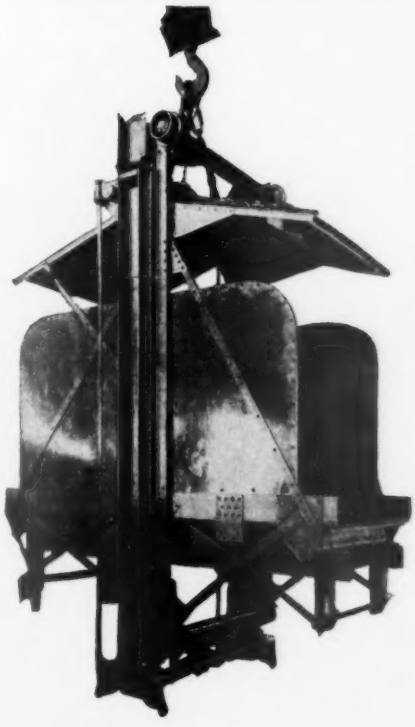




6', 8', 10' and 12' dia. cast steel sheave wheels. Machine grooved—keyed or pressed on shaft.

EVERY piece of mechanical equipment for use in coal mining is critical in the problem of mechanization. The degree of efficiency of each machine is reflected in the success or lack of success of the mechanization program. Vulcan's complete line of equipment is designed with a knowledge of the full requirements of mining from a background of over 80 years' extensive service in all the important mining fields of the world. Through this experience and the scope of Vulcan resources we are able to offer many refinements in mechanism

COAL MINING EQUIPMENT



A typical Vulcan all steel, self dumping heavy duty mine cage with safety appliances.

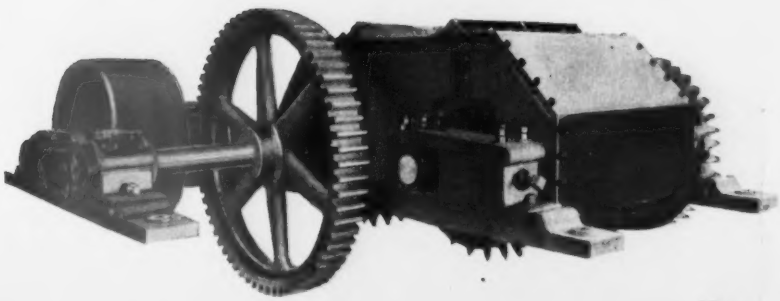
that increase the efficiency and life of coal mining equipment. Our engineering experience is at your disposal and we will be glad to consult with you about any mining or equipment problem. Our extensive list of bulletins covers practically every phase of mining. Tell us the equipment you are interested in and we will send you bulletins.

Briefly described on these two pages are a few examples of the many types of mining machinery Vulcan builds. Fuller description and further advantages of these and similar equipment may be found in our bulletins.

Other Vulcan equipment includes a shaking conveyor, low in height, with flexible joints, swinging and extensible shovelers and a swinging discharge chute; all types of fans and ventilation equipment; kilns; crushing mills; large and small steel castings; herringbone gears.

VULCAN IRON WORKS

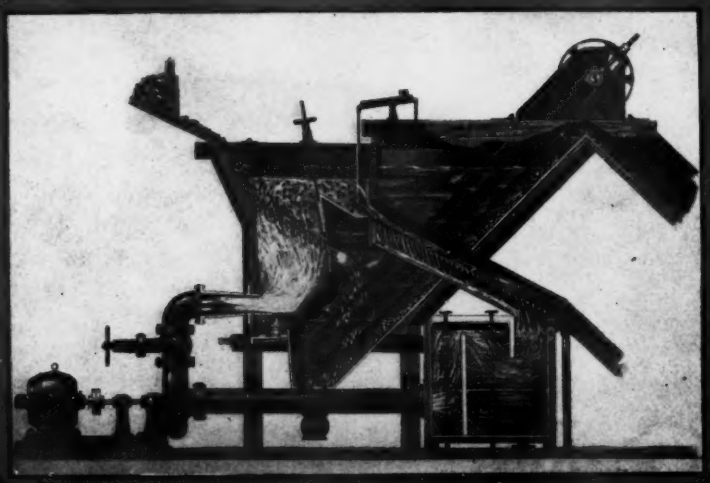
Wilkes-Barre, Pa.



36" x 48" manganese segmental all steel crusher rolls. They are carefully designed for most economical crushing.

THE SINGLE UNIT!

Single Unit Menzies Hydro-Separators have been installed in more than 185 cleaning plants. More than 11,000,000 tons of coal are cleaned annually by these equipments which are ideal for complete washing of sized domestic coals and primary washing of close gravity coals that are finally separated in double and triple cell Hydro-Separators.

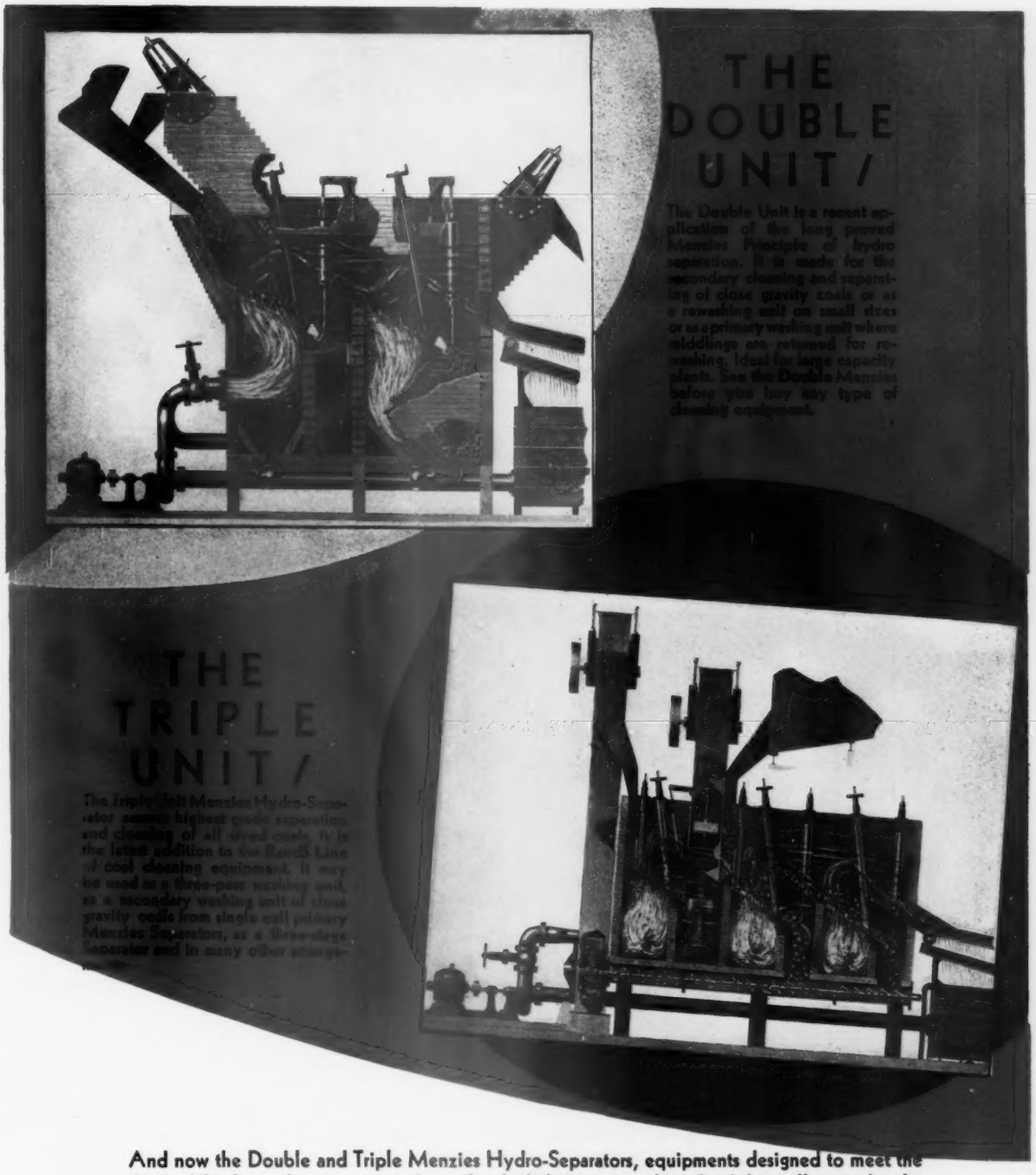


MENZIES HYDRO-SEPARATORS

NOW AVAILABLE IN SINGLE DOUBLE AND TRIPLE UNITS!

ON DISPLAY AT AMERICAN MINING CONGRESS
Booths 130 and 131
CINCINNATI, OHIO
May 5th to 9th

The AMERICAN MINING CONGRESS "Little Exposition"


THE DOUBLE UNIT /
The Double Unit is a recent application of the long proved Menzies Principle of hydro separation. It is made for the secondary cleaning and seperating of close gravity coals or as a rewashing unit on small sizes or as a primary washing unit where middlings are returned for rewashing. Ideal for large capacity plants. See the Double Menzies before you buy any type of cleaning equipment.
THE TRIPLE UNIT /
The Triple Unit Menzies Hydro-Separator assures highest grade separation and cleaning of all sized coals. It is the latest addition to the Rand® Line of coal cleaning equipment. It may be used as a three-pass washing unit, as a secondary washing unit of close gravity coals from single cell primary Menzies Separators, as a three-stage separator and in many other arrange-

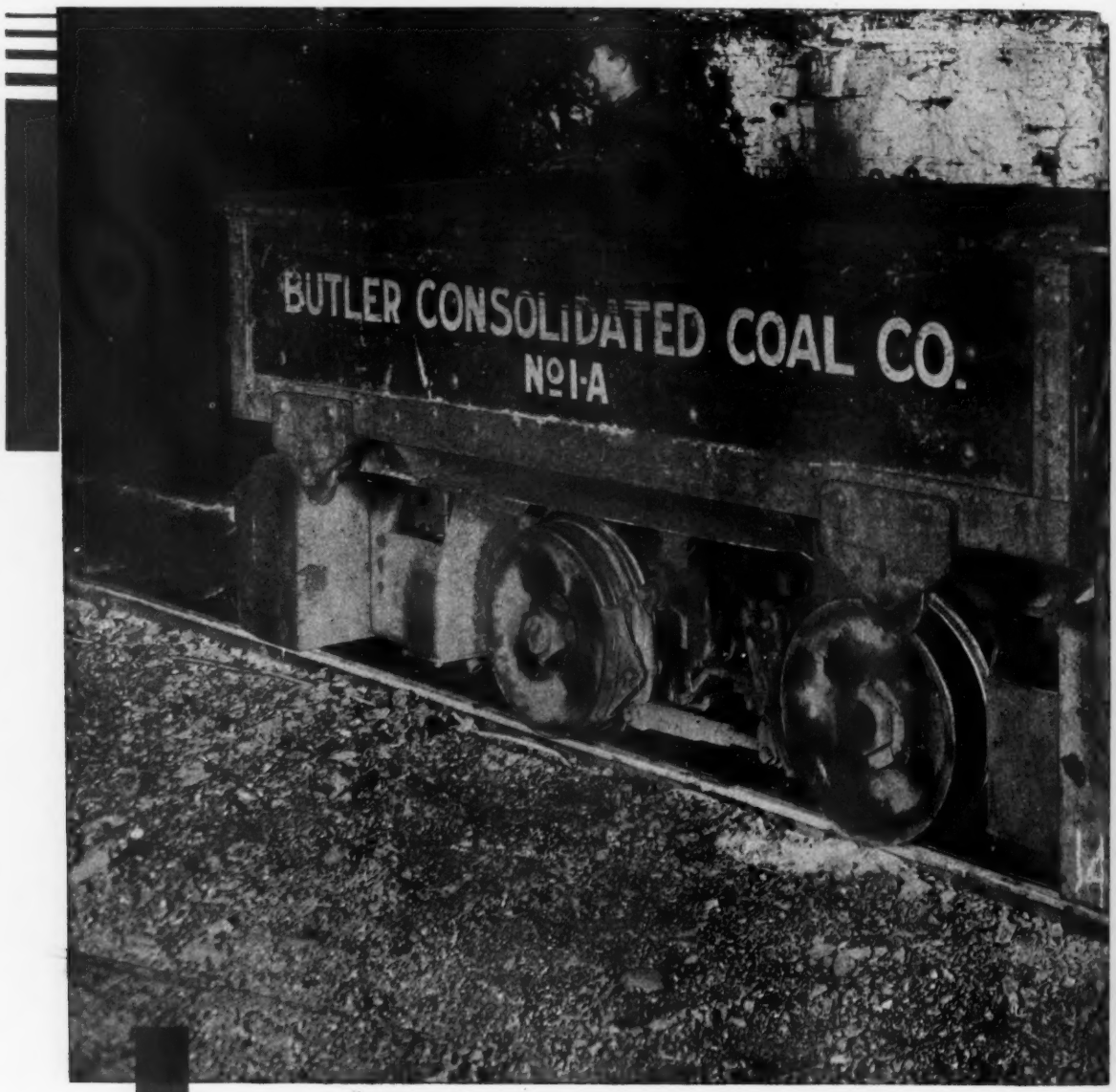
And now the Double and Triple Menzies Hydro-Separators, equipments designed to meet the demand for low ash, superior grade coals which feature complete flexibility, allowing for the rewash of the entire run or of the close gravity coals only or the individual washing of certain sizes or gravities. They feature the elimination of hand picking of nut and egg sizes, high capacity, trouble-free operation and the ultimate in efficiency.

Let our cleaning plant engineers explain these latest adaptations of the proved Menzies Principle of Hydro-Separation and Cleaning to you while you are in Cincinnati, May 5 to 9, at Booths 130 and 131 or if you do not attend, send for our new Bulletin No. 127 which completely explains these new cleaning units and their application.

ROBERTS AND SCHAEFER CO.

ENGINEERS and CONTRACTORS

PITTSBURGH, PA., 418 OLIVER BLDG. WRIGLEY BUILDING, CHICAGO HUNTINGTON, W. VIRGINIA, 514 NINTH AVE.



In Wildwoods Program

OF 100% MECHANIZATION

MANCHA STORAGE BATTERY LOCOMOTIVES—HANDLE ALL COAL IN INITIAL STAGES—

The AMERICAN MINING CONGRESS "Little Exposition"

This photograph shows one of the seven Mancha "Electric Mules" in the great Wildwood Mine—all 8 ton "Hercules X" permissible type storage battery locomotives. They're kept *busy* gathering the 300-tons-an-hour output. It is significant that Mancha "Mules" fitted in perfectly with the idea at Wildwood—of using the most *modern type* of mechanical equipment, to operate *at a profit.* Mancha "Electric Mules" need no introduction to experienced coal mine operators. Their strength, performance, and economy have been tested in years of actual service.

AND REMEMBER MANCHA'S "COALGETTER"

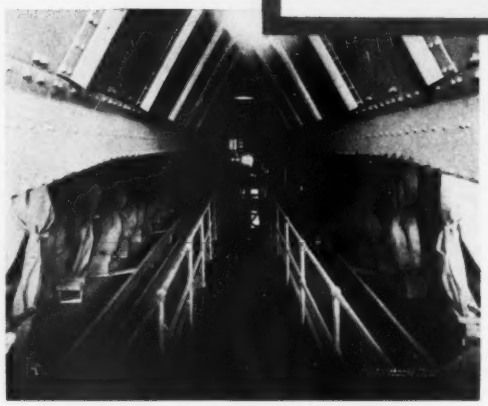
the low-priced, rugged pit-car loader . . . for cleaner coal at less cost.

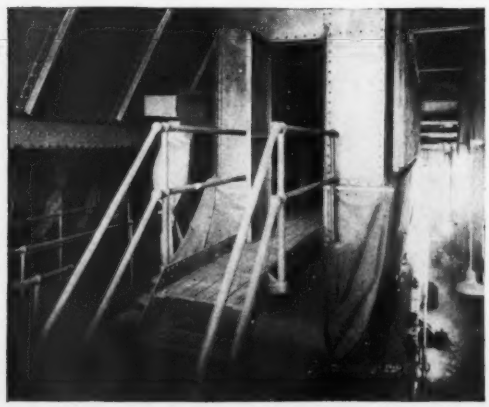
You can put your mine on a mechanical basis and yet use the intelligence of human loaders increasing tonnage and at the same time getting cleaner coal. Get bulletin. Write us about your haulage problem. Maybe we can help you.

MANCHA STORAGE BATTERY LOCOMOTIVE COMPANY
1909 S. Kingshighway • • • • St. Louis, Mo.

MANCHA'S ELECTRIC MULE

Acosta Cleaning Plant, C



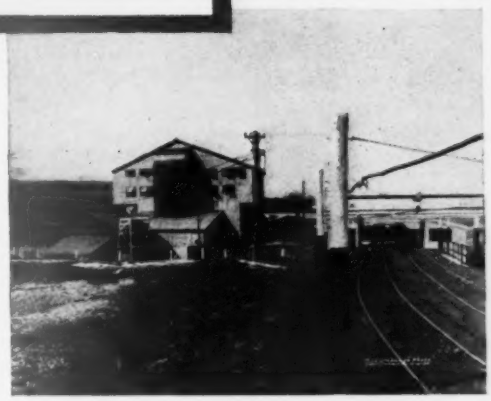


THE Acosta Cleaning Plant has a capacity of 300 tons per hour.

The Peale-Davis System is a dry cleaning process that cleans coal without presizing.

1. Dry washing without pre-sizing. (6" to dust)
2. One primary table of large capacity
3. One secondary or re-treatment table, minimizing coal loss
4. Simple dust collecting system without the use of mechanical means
5. Elimination of multiple screening units and minimization of coal breakage
6. Elimination of multiple tables

Consolidation Coal Company



7 Minimization of coal freezing in railroad cars

8 Low installation cost

9 Low power and labor costs

10 Low maintenance cost

11 Small floor space required

12 High recovery and maximum refuse removal

THE Acosta Plant Cleaning Consolidation Jenner coal is located near New Somerset, Pennsylvania.

This plant was built and erected by the Fairmont Mining Machinery Company, Fairmont, West Virginia.

PEALE DAVIS

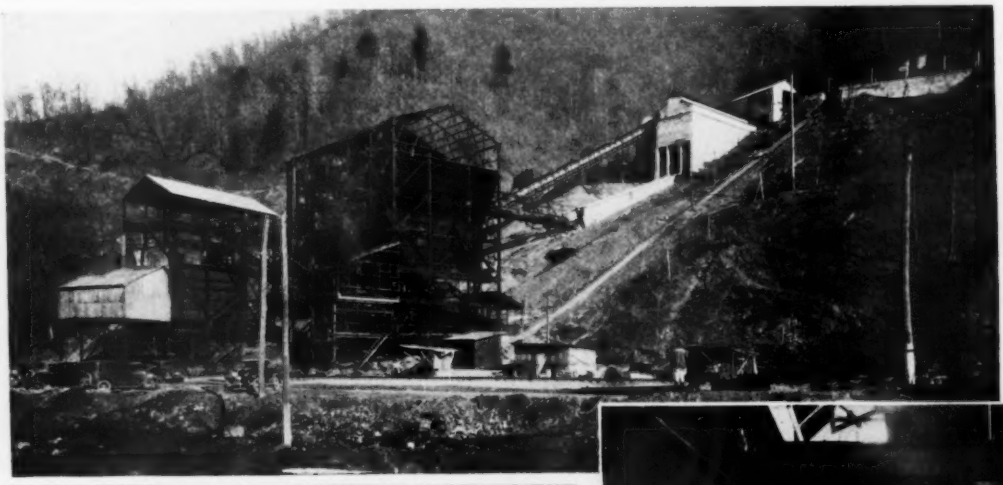
PENNSYLVANIA MINING MACHINERY CORP.

ST. BENEDICT, PENNA. 2007 GRAYBAR BLDG., NEW YORK, N. Y.

What is the Answer?

Selling Coal Is a Real Job--Unless You Can Offer Better Coal Than Your Competitor

Dry Cleaned Coal!



Carbon Fuel Co., Carbon, W. Va.
Above: Tipple and Cleaning Plant under Construction.

Right: Part of Drive of Peale-Davis Table.

For 27 years we have been designing and building tipples and tipple equipment.

Recently we were licensed to design and construct PEALE-DAVIS system dry cleaning plants.

Already we have under construction or completed FOUR PEALE-DAVIS PLANTS.

Consult Our Engineers

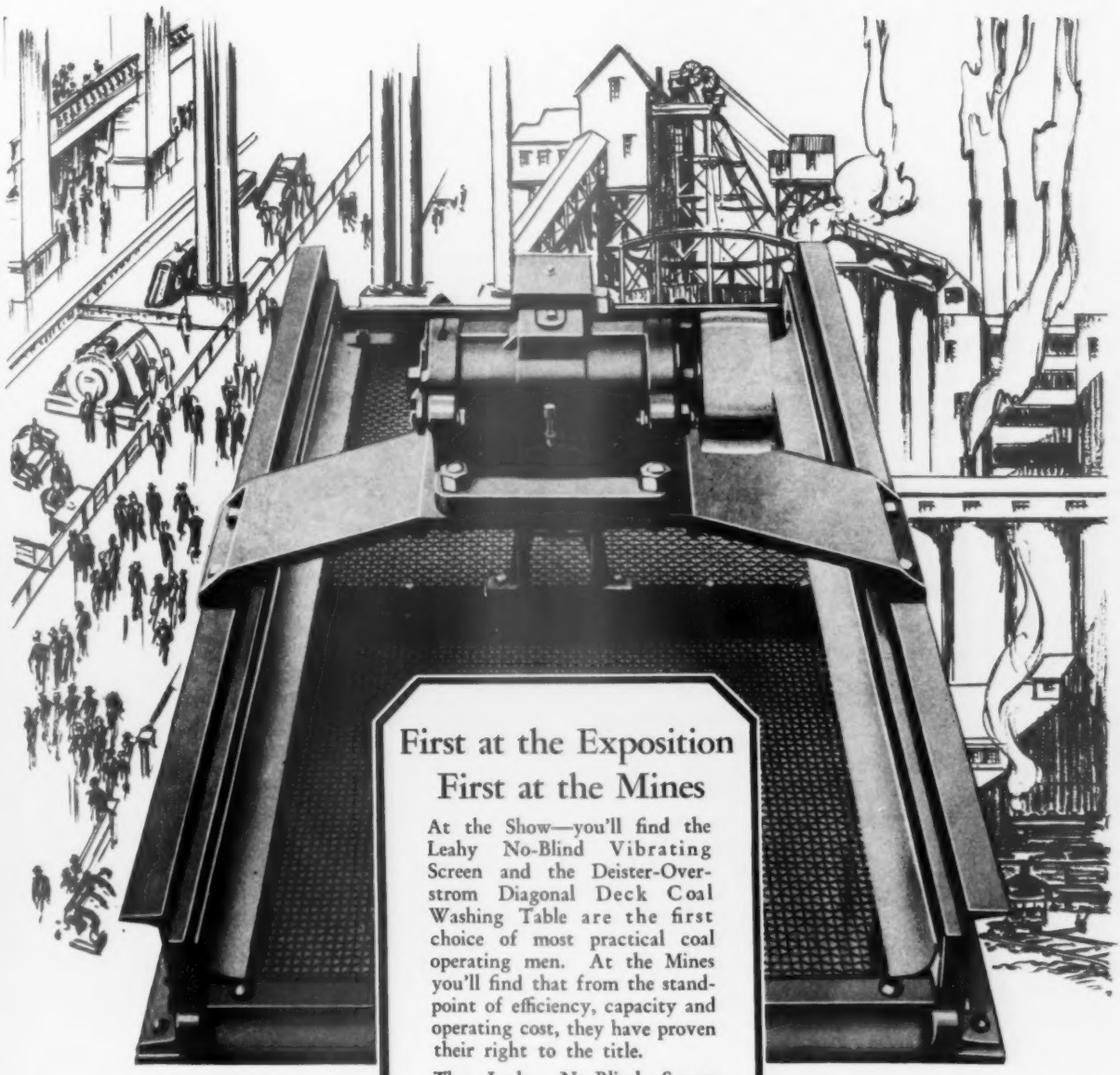
FAIRMONT MINING MACHINERY CO.

FAIRMONT, WEST VA.

DESIGNERS, MANUFACTURERS, ERECTORS COMPLETE COAL PREPARATION PLANTS

Booth No. 17—Cincinnati, May 5-9

The AMERICAN MINING CONGRESS "Little Exposition"



First at the Exposition
First at the Mines

At the Show—you'll find the Leahy No-Blind Vibrating Screen and the Deister-Overstrom Diagonal Deck Coal Washing Table are the first choice of most practical coal operating men. At the Mines you'll find that from the standpoint of efficiency, capacity and operating cost, they have proven their right to the title.

The Leahy No-Blind Screen sizes coal with amazing speed. Quick, clean-cut separation, low operating cost, simplicity and long life are its features.

Deister-Overstrom Coal Washing Tables eliminate 90% to 95% of removable impurities, with minimum loss in the refuse.

THE DEISTER CONCENTRATOR COMPANY

901 Glasgow Avenue
FORT WAYNE, INDIANA

Manufacturers of

DEISTER AND DEISTER-OVERSTROM ORE CONCENTRATING AND COAL WASHING TABLES

LEAHY NO-BLIND VIBRATING SCREENS

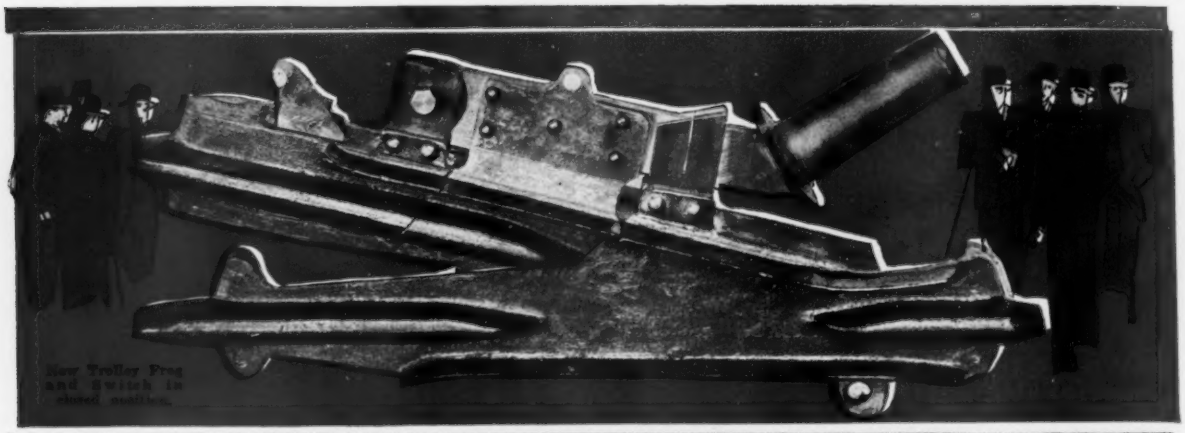
NEW YORK OFFICE AND FOREIGN SALES DEPARTMENT

104 Pearl St.
New York City

CABLE ADDRESS:
Retsied

The DEISTER CONCENTRATOR COMPANY

The AMERICAN MINING CONGRESS "Little Exposition"

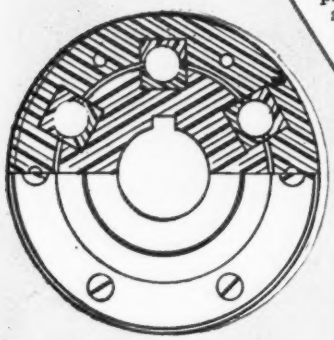


NEW IDEAS
Save Time and Money

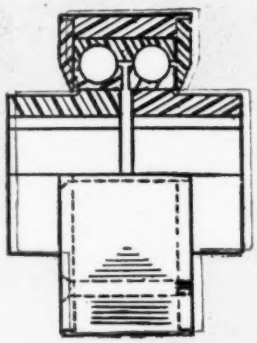
New answers to old problems are these PENMACO products, two of which will be shown for the first time at Cincinnati in May. In them practical mining men will find solutions to electrical haulage problems and better mechanical power transmission with our FLEXIBLE coupling.

1. New—Combination Trolley Frog and Section Switch. Easy to install—no hangers or extra wiring required—positive in action—heavy construction eliminates mechanical troubles—ample carrying capacity.
2. New—Davis "FLEXIBLE" Coupling—100% driving efficiency at all angles up to limit of coupling—hardened steel balls and keys—perfect, smooth drive at all speeds and loads. Nothing to break or wear out.
3. Improved—EVERLAST Rail Bond—flexible copper cable welded to wrought iron terminals—easy to install—will last as long as the track—may be used over and over again.

End View—Davis' FLEXIBLE Coupling

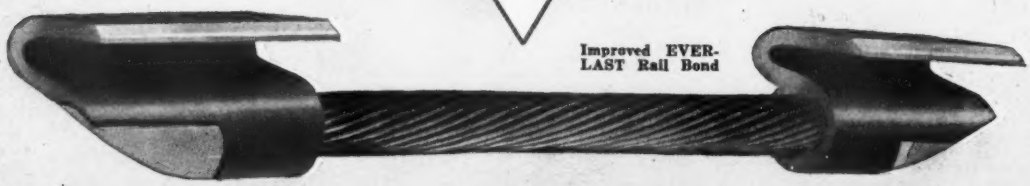


Side View—Davis' FLEXIBLE Coupling



These and many other new products will be on display at Booth 148 at the American Mining Congress Exposition—May 5 to 9

Improved EVERLAST Rail Bond



PENN MACHINE COMPANY
JOHNSTOWN, PENNA.

The AMERICAN MINING CONGRESS "Little Exposition"

★ Roll-of-Honor Machines

STEEL PANS FOR FACE CONVEYORS
MINE CARS (STEEL OR WOOD)
MINE CAR WHEELS
ROLLER BEARING WHEELS
(All Types)
PHILLIPS OPEN CAP WHEEL TRUCKS
GRAVITY SCREENING EQUIPMENT
TIPPLE CHUTES
RADIAL CHUTES
SCREEN BARS
MINE RUN WEIGH HOPPERS
CROSS-OVER AND PUSH BACK DUMPS
GRAVITY ROTARY DUMPS
CAR STOPS TRIP CONTROLLERS
CAGING MACHINES

THIRTY-TWO years' experience in designing and building coal mining and handling equipment are back of every Phillips product . . . experience that has taught Phillips how to build mine equipment to meet YOUR operating conditions—that give more service—wear longer—cost less to maintain . . . experience that has placed Phillips-built equipment on every coal man's Roll-of-Honor.

PHILLIPS

MINE and MILL SUPPLY CO. Pittsburgh, Pa.

NATIONAL
ARMATURE & FIELD COILS
will help you to
REDUCE MAINTENANCE COSTS
Send us your inquiries
National Armature & Electric Works
J. W. Overstreet, General Manager,
BLUEFIELD, W. VA.
You are cordially invited to visit us and personally inspect our product
BOOTH 59
AMERICAN MINING CONGRESS
CINCINNATI, OHIO—MAY 5-9

LIGHT
—where you want it!

National Carbide VG Handy Light

For the Big Job

National Carbide VG Light

For Car Inspection, Signal & Maintenance Departments

National Carbide Lantern with or without Rear Light of Red, Blue or Green.

There is no substitute for steady light—plenty of it—and where you want it—especially in railroad work.

In the three products illustrated we offer "Portable Daylight" to increase the speed, efficiency & economy of all railroad operations.

Lights for all emergencies; also for inspection, signal, motor car and maintenance.

Write for prices, photos and more complete data.

NATIONAL CARBIDE SALES CORP., 342 Madison Ave., New York, N. Y.

Parallel Ground Throw Type J

In the CENTRAL catalog are illustrated and described, rugged, durable, and economical standard equipment, made of the best materials obtainable, for every mine track use.

Free copy on request

Our Engineers at your service

THE CENTRAL FROG & SWITCH COMPANY

Box 9, Station O
CINCINNATI, OHIO

Out of the Red..... into the Black!

MANY a coal operator has found the answer to his mechanization problems in Tracy Pit Car Loaders. Many a mine has been snatched from virtual bankruptcy—from production at loss to production with profit—through the savings in operating costs effected by mechanization.

Tracy Pit Car Loaders do all that has been promised for mechanization in lowering the cost of coal loading.

THE Tracy Pit Car Loader will deliver uninterruptedly all the coal that three men can feed to it—and more. Miners prefer the Tracy because it is lightest in weight (1,000 pounds), most flexible, most easily manipulated into loading position and is capable of sustained duty without loss of time or wasted effort.

Before you deny yourself the advantages which others are obtaining through the use of Pit Car Loaders—before you say: "It can't be done"—talk it over with a Tracy representative.

BERTRAND P. TRACY CO.
Designers and Builders
Pittsburgh, Pa., Huntington, W. Va.

The TRACY PIT-CAR LOADER

The AMERICAN MINING CONGRESS "Little Exposition"

New efficiency in pit car loading

The MT. VERNON

READY TO LOAD

READY TO TRAVEL

Insert shows the loader raised on the trailer truck ready for easy moving about on four wheels. The upper photograph shows this trailer truck folded up and the machine in position for loading.

PIT CAR LOADER

HERE is the improved Mt. Vernon—a highly efficient loader that is particularly well equipped for ease in use and handling. It is rugged in design but simply constructed. All parts are fully protected yet readily accessible—allowing easy maintenance. Power requirements are low—ball bearings are used throughout and the flight conveyor chain is of the roller type. Motor has under-voltage release and over-load protection. Speed reducer gears are encased in oil. The floor is built 3/16 inch thick for heavy duty.

These new Mt. Vernon loaders will operate at a minimum height of 35 inches or as much higher as required. They are built in three sizes—weights varying from 1,250 to 1,600 pounds—and are designed to suit any length or height of car. Write for further details or see this loader at Cincinnati.

Get more details at the American Mining Congress' Exposition at Cincinnati— Booths 39, 39A.

MT. VERNON CAR MANUFACTURING CO., - - Mt. Vernon, Ill.

The MINING CONGRESS Journal

Convention Proceedings Issue

CONVENTION PROCEEDINGS NUMBER

After the Show

Picture three thousand coal men treking back to mine and mill after the American Mining Congress Convention. New ideas in mine mechanization, maintenance, transportation fill their minds—ideas that they are anxious to apply to the operation of their own properties.

Other thousands unable to go to Cincinnati—Eagerly they await the report of what transpired there. They know that what was said, seen and done there vitally affects their economic future.

Here, a prime market waiting for you—a sales opportunity that comes not often. Here, too, a way to reach that market—every single man of it—profitably.

June 15th, The Mining Congress Journal will publish an extra "Convention Proceedings" issue, reporting in full all of the 39 papers given at the 7th Annual Convention of Practical Coal Operating Men, together with the complete official convention report.

An *all coal* circulation of 12,235 copies is guaranteed to saturate the industry. Every man attending the convention will receive a copy—after he gets home. Every important executive in every known coal operation will receive a copy—whether he goes to Cincinnati or not.

No publication in the coal industry can compare with it for reader interest or advertising coverage in any way shape or form. Make your reservation now for advertising space in the June 15th issue.

The Mining Congress Journal
851-Munsey Bldg.-Washington, D.C.

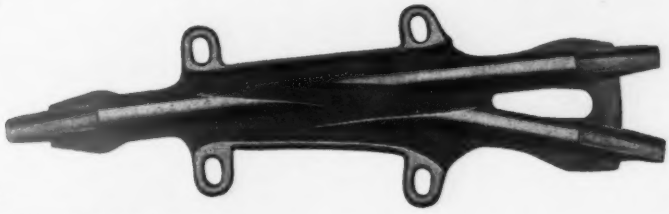
Good Line material *also saves* Haulage dollars···

The *Archi mine clamp* is the most powerful ever developed. It is easy to apply, but hard to tear loose.

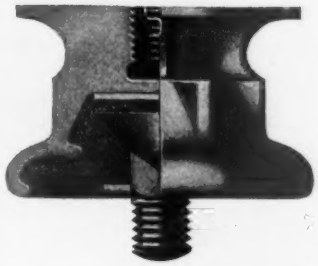
WESTINGHOUSE line material for mines is built expressly for the job, and forms that important link in the haulage system which assures effective locomotive performance. In many mines throughout the coal fields of the country, Westinghouse line material is cutting operating expenses by reducing maintenance and repair costs.

Illustrated are some of the various items of line material with which operators are saving haulage dollars.

For either an emergency or permanent job, the type *SL splicer* cannot be surpassed.



The average life of the type *CF frog* with overlapping runners, is four times that of the old style frog without such runners.



Westinghouse *mine hangers*, insulated with Moldarta, strengthen and protect line material.

The new and improved *Double-Gap section insulator with switch*, combines both strength and safety.

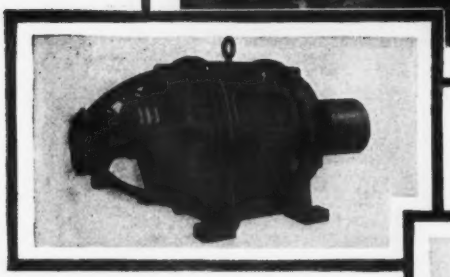
Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops

Westinghouse

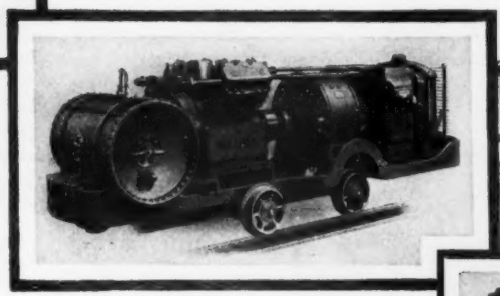
T 31222

To assist in MECHANIZING

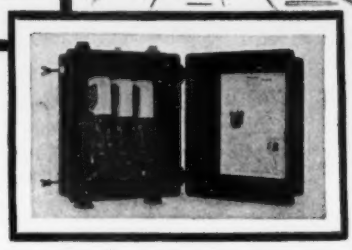
Westinghouse CS Squirrel Cage Motor applied to Cog Belt Drive. These drives are particularly adaptable where large speed changes are required or where short center-to-center distances are desirable. They require no lubrication, do not transmit vibrations, and are not affected by moisture or dust.



Production continues as long as the conveyor or fan runs. Sealed Sleeve Bearings, Dual Treated Windings and Directed Ventilation protect Westinghouse motors from dust and severe conditions and thus prevent shut-downs. The motor shown here is the wound-rotor type of induction motor, designed for variable speed and high torque service.



Westinghouse Type SK, industry's most popular general purpose direct-current motor is used extensively on compressors, hoists and scrapers down in the mine.



Push a button and the Westinghouse Line-starter starts the motor. This control provides convenience for the operator and protection from overload for the driven machinery and motor. De-ion arc-quenchers insure long life of its contacts. The Line-starter shown here is the dust-tight type.

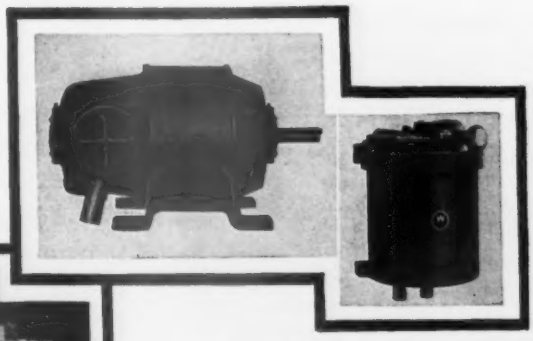
your MINE • • •

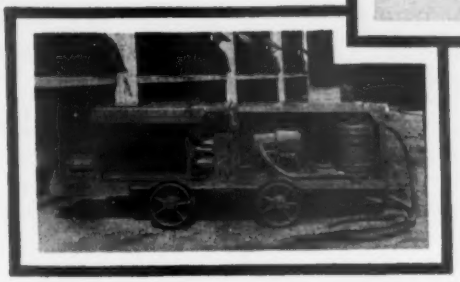
IN mechanizing your mine to meet the modern demand for lower production costs and uninterrupted output, we realize your need for especially adapted electrical equipment of the highest quality.

Westinghouse motors and control are designed to meet the most unusual demands of the mine—from the giant motor that powers the hoist to the tiny one that drives the blower at the working face.

The motors and control pictured here are representative of the wide range of mining applications which Westinghouse serves.

Westinghouse Explosion-Tested Motors and Control power productive machinery down at the face where permissible equipment is required. High-grade materials throughout, such as mica insulation in the motor windings, protect this equipment from bucking loads or other severe service conditions. The MSA High Pressure Rock Dust Distributor shown here is equipped with this motor and control.





This Westinghouse explosion-tested Room Hoist Motor and Control may also be applied to loading machines and conveyors inside or outside the mine.

You are cordially invited to visit the Westinghouse Exhibit at the American Mining Congress Convention in Cincinnati

BOOTHS 120 & 141

Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops

Westinghouse

T 31232

221 Tons per Hour

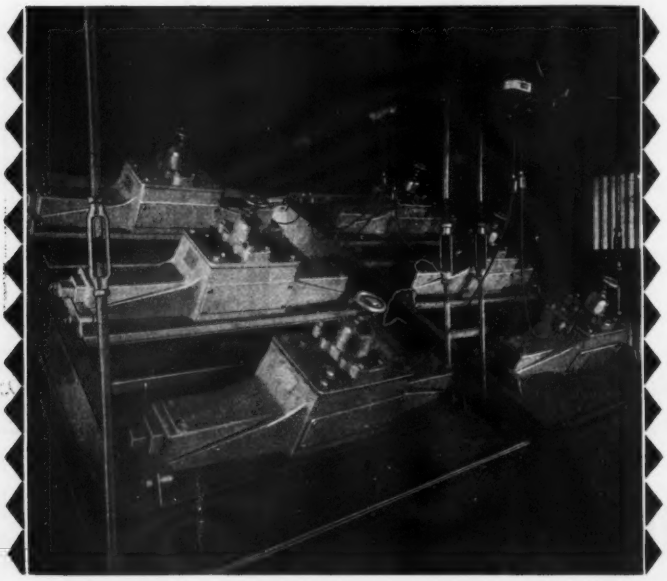
—with only 48 square feet of screening surface!

221 tons of 2″ slack per hour!

4.6 tons per square foot of screening surface!

An immense feed-even without the varying moisture conditions which prevail at the United Electric Coal Company, Duquoin, Illinois – one of the largest strip mines in the world!

But the Hum-mer Screens at this plant are handling it successfully—they are thoroughly removing the ¾″ coal with a screening area of only 48 square feet and a power consumption of only 2½ H. P.!



This coal comes from open pits—often under water—and is screened without preliminary treatment!

Hum-mers are also making a 3/16″ separation at this plant—two 4′ x 7′ units handling 120 tons per hour!

Such a record was made possible only by the immense capacity and unusually thorough sorting action of the Hum-mer Electric Screen!

The Hum-mer screens huge tonnages more accurately and more thoroughly than any other device!

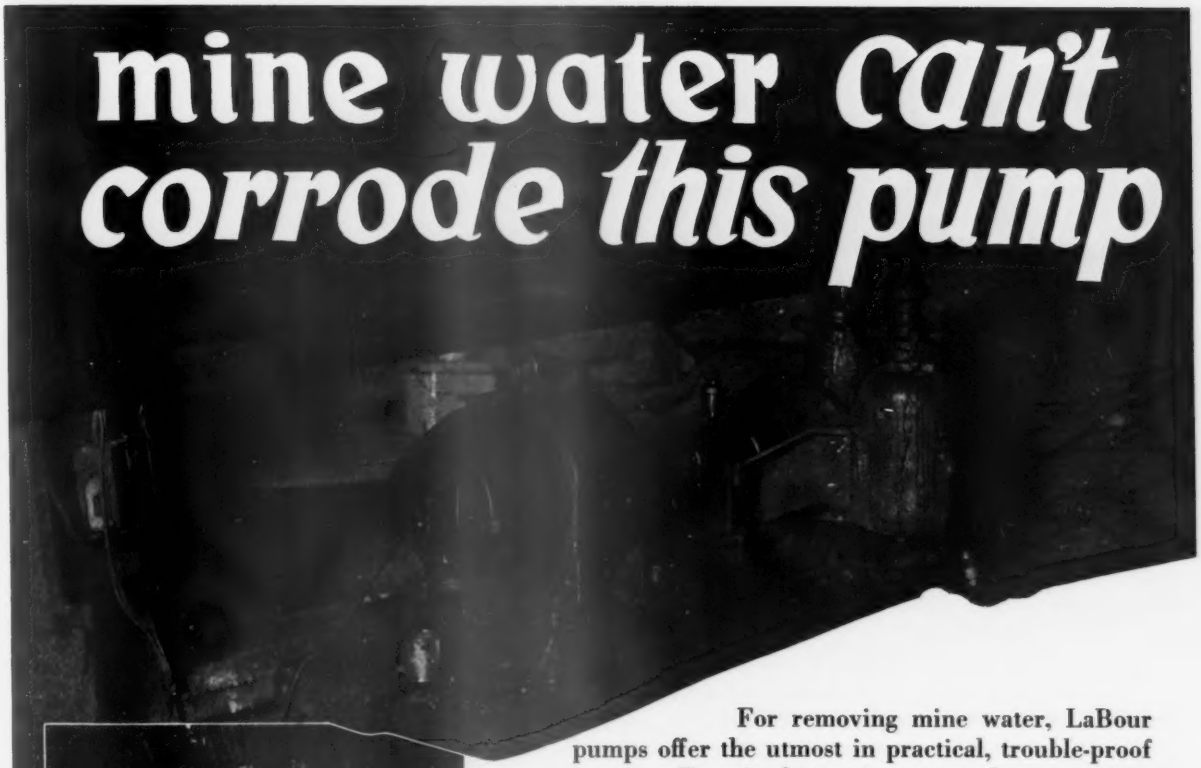
It will pay you to investigate the Hum-mer for screening coal.

THE W. S. TYLER COMPANY
Cleveland, Ohio
Manufacturers of Woven Wire Screens and Screening Equipment

HUM-MER
***Electric* SCREEN**

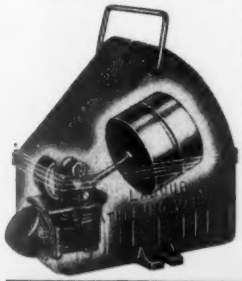
To be exhibited at
MINING CONGRESS CONVENTION
Cincinnati, Ohio – May 5-9

mine water can't corrode this pump



Pouring LaBour ELCOMET "K"—the corrosion resisting alloy of which LaBour Self-Priming Centrifugal Pumps for mine water gathering are built.

The LaBour Gathering Valve automatically seals the suction line when water is low, enabling the pump to gather from other sumps simultaneously at different levels. Corrosion proof.



For removing mine water, LaBour pumps offer the utmost in practical, trouble-proof service. Even in those mines or on those occasions in which *corrosive* water is encountered, LaBour pumps still provide the same trouble-proof service.

Built of ELCOMET "K" alloy—a corrosion resistant developed by LaBour—these rugged, compact pumps prime themselves automatically, operate continuously without superintendence, and gather corrosive mine water without impairment of their pumping efficiency.

No valves, gears, or other auxiliaries are needed. LaBour Pumps actually pump air and prime themselves, and with LaBour Gathering Valves in service LaBour Pumps will handle water from two or more sumps at different levels. Ample clearances within the pump casing permit the impeller to handle dirty water without clogging.

Let us give you the whole story of LaBour performance. Write today for BULLETIN 31. It will be sent to you without obligation.

THE LABOUR COMPANY, INC.
ELKHART, IND.

LA BOUR PUMPS

NEVER LAY DOWN ON THE JOB

61 G-E Locomotives in Clearfield Bituminous Mines

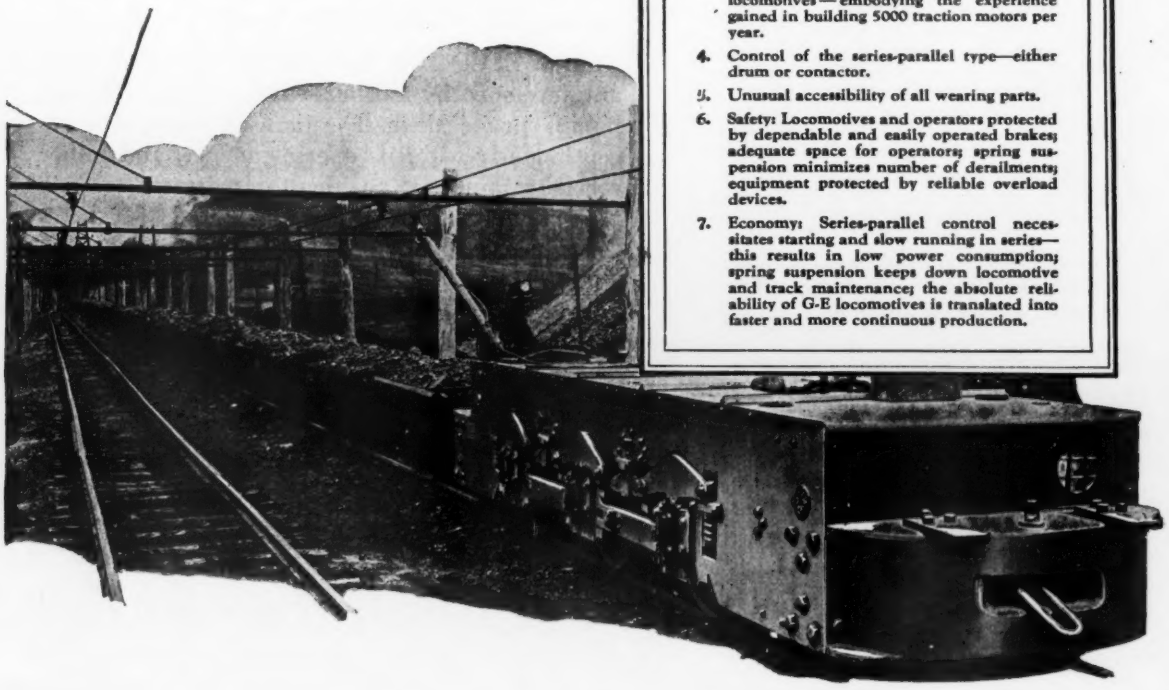
SIXTY-ONE electric locomotives—all bearing the G-E monogram—are in use on the properties of the Clearfield Bituminous Coal Corporation.

Clearfield has used G-E locomotives for years because it has found them to be a good product—reliable under all conditions, requiring very little upkeep, good for a lifetime of service.

Let your nearest G-E office be your headquarters for new locomotives, repair parts, and engineering assistance.

These Good Features Contribute to the Reputation of G-E Mining Locomotives

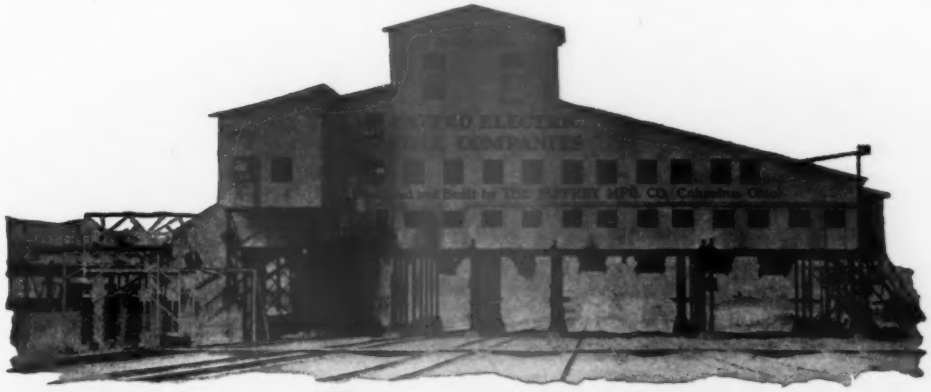
1. Frames cut from solid rolled steel insure maximum strength.
2. Leaf springs with equalizers—originated by General Electric for modern mine locomotives.
3. Motors unequalled by any others used on locomotives — embodying the experience gained in building 5000 traction motors per year.
4. Control of the series-parallel type—either drum or contactor.
5. Unusual accessibility of all wearing parts.
6. Safety: Locomotives and operators protected by dependable and easily operated brakes; adequate space for operators; spring suspension minimizes number of derailments; equipment protected by reliable overload devices.
7. Economy: Series-parallel control necessitates starting and slow running in series—this results in low power consumption; spring suspension keeps down locomotive and track maintenance; the absolute reliability of G-E locomotives is translated into faster and more continuous production.



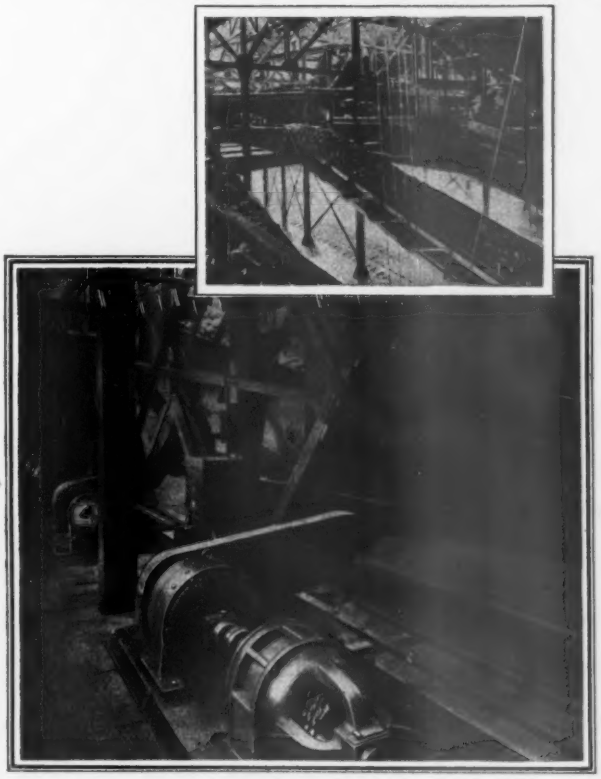
360-50

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SALES AND SERVICE IN PRINCIPAL CITIES



This Giant Tipple *motorized by* G.E.



800 tons of coal per hour; the ability to place lump, 3 by 6 egg, 2 by 3 egg, nut, slack, and top coal on separate tracks simultaneously—or any mixture of these grades as desired; the largest railroad-car storage (both empty and loaded) of any mine in the world—these are some of the unique features of this remarkable tipple, which has been completely motorized by General Electric.

1000 horsepower in G-E motors; the most modern of G-E magnetic controllers for each motor; the coördination of motors, controllers, and machinery to achieve maximum production, safety, economy—thus has G-E Motorized Power been enlisted in this spectacular and successful attack on the cost of handling coal.

There is a G-E office near you—with alert, well-trained engineers to help you in every electric problem of mining and preparation.

Motorized Power
—fitted to every need

200-337

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

100 *pages of* G-E LINE MATERIAL

THIS new catalog, GEA-611, describes all standard G-E line-material devices and includes dimensions, weights, and prices. A copy is available to you without charge. Simply address your nearest G-E line-material dealer, your nearest G-E sales office, or General Electric Company, Schenectady, N. Y.

GENERAL ELECTRIC

Join us in the General Electric Hour, broadcast every Saturday evening on a nation-wide N.B.C. network

370-20

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

Why do these finest of fine lubricants often cost you nothing...?

GLANCE at these facts and you will readily see why:

Keystone Lubricants, while costing more per pound than most other lubricants because of their extremely high quality, reduce wear and upkeep on machinery to such an extent that the *total cost* of these lubricants is more than returned to you by this additional saving in repair bills alone. Letter after letter in our files, open to anyone, bears this statement out.

Not only do these fine lubricants usually cost you nothing in the end, but the actual, tangible month-by-month bills for lubricants will be less with Keystone grease because of its proven, longer service life.

We would like nothing better than an opportunity to prove these facts to your complete satisfaction on your own machinery. Just let us know when you would like an engineer to call. Keystone Lubricating Co., 21st, Clearfield & Lippincott Sts., Philadelphia, Pa. Established 1884

KEYSTONE TRADE MARK REG. U.S. PAT. OFF. GREASE

KEYSTONE *Lubricants*

— — and you'll say, too — it's a low down hog

Low Down—For Easy Loading

A Hog—For Capacity

Call at Booth 163—The Cincinnati Show May 5th to 10th

AND SEE WHY!

ENTERPRISE CAR & WHEEL CORP

BRISTOL, VA.-TENN. **HUNTINGTON, WEST. VA.**

CHOSEN BECAUSE OF PERFORMANCE

The nine Hercules permissibles listed to the right have been scientifically developed to meet every coal blasting need. All have proved their worth by performance in service.

Even though the Hercoals are comparatively new, today they are leading permissibles. Why? Because they make lump coal comparable to that produced by black powder, at no greater cost, with much better fumes—*and are permissibles.*

These advantages have prompted many bituminous producers to turn to Hercoal F, D, or C in the short time these permissibles have been available.

The other Hercules permissibles have distinct characteristics, which, with the Hercoals, fulfill every coal blasting requirement.

Further information can be obtained by using the coupon list at the right.

HERCULES POWDER COMPANY

(INCORPORATED)

ALLENTOWN, PA.
BIRMINGHAM
BUFFALO
CHICAGO
DENVER
DULUTH
HAZLETON, PA.
HUNTINGTON, W. VA.
JOPLIN, MO.
LOS ANGELES
Wilmington Delaware
NEW YORK CITY
NORRISTOWN, PA.
PITTSBURG, KAN.
PITTSBURGH, PA.
POTTSVILLE, PA.
ST. LOUIS
SALT LAKE CITY
SAN FRANCISCO
WILKES-BARRE
WILMINGTON, DEL.

The Permissible For Your Coal Is In This List

☐ **HERCOAL-F:** The new type lump producer. A very high cartridge count permissible (about 500)* with black powder action.

☐ **HERCOAL-D:** This Hercoal lies between F and C in count (about 450),* and like them is a black powder action, lump producer.

☐ **HERCOAL-C:** Another black powder action, lump producing permissible. Lower count (about 400),* and stronger per cartridge than Hercoal-F.

● ● ●

☐ **RED H F-L. F.:** Slow and strong with a cartridge count of about 356.* A lump producer.

☐ **RED H D-L. F.:** Slow and strong. Cartridge count around 316.* Another lump producer.

☐ **RED H C-L. F.:** Slow and strong. About 276* count and a lump producer.

☐ **RED H B-L. F.:** A fast, dense, strong permissible of about 280* count with a smashing action.

● ● ●

☐ **COLLIER C-L. F.:** Fast and strong but with higher count (about 320)* than Red H B-L. F.

☐ **HERCOGEL:** Dense and strong. Suitable for wet work. Count about 190.*

***NOTE: Cartridge counts refer to the number of 1¼" by 8" cartridges in 100 lbs. of explosives.**

● ● ●

HERCULES POWDER COMPANY
(Incorporated)
934 King Street, Wilmington, Delaware

Gentlemen: Please send me pamphlets describing the Permissible explosives checked.

Name.....

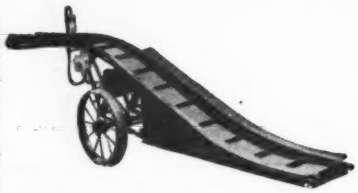
Company.....

Street.....

P. O.....

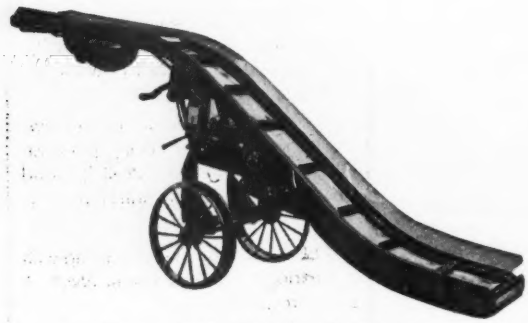
E-6

NORTHERN'S MODERN MECHANIZATION >> UNDERGROUND



Style B, Model 45B Pit Car Loader with standard overhang and light.

Patented April 23, 1929—Patent No. 1710129—
Other Patents Pending



Heavy duty, 20 in. wide Pit Car Loader.

ANTHRACITE, semi- or Bituminous, Cannel, Lignite . . . wherever coal is mined below ground you will find Northern Pit Car Loaders. For these are the world's standard—originated and patented by Northern.

PERMISSIBLE

Approved for use in all mines, including gaseous—six types make possible the fitting of this equipment to any conditions, in any cut and on any facing at any depth.

And, since Northern makes every part that goes into the machines (excepting only motors and cables) you are sure of getting the utmost in service and repair parts or mechanical aid, *if, when and as needed.* More, this complete factory set-up, with sales and service in every mining field enables us to assist you in the solution of any coal handling problem in shortest time and with greatest economy.

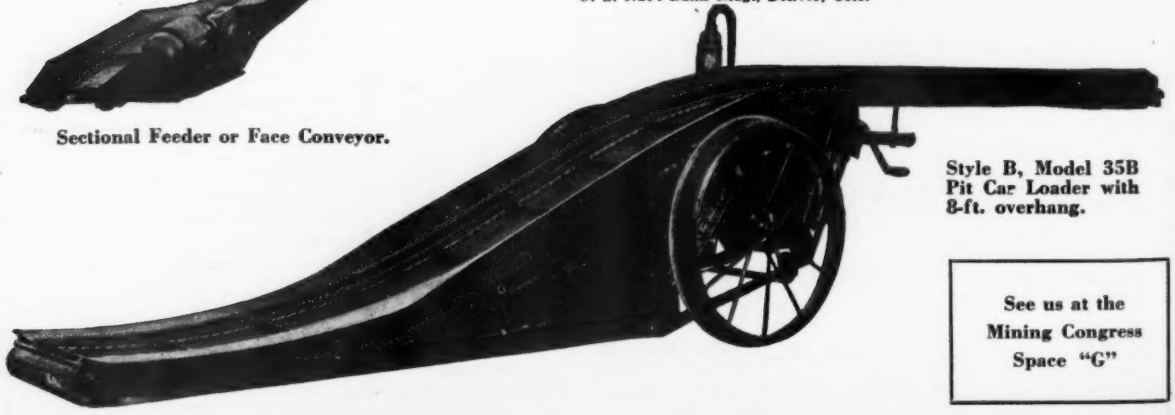
A new bulletin is just off the press; it covers Northern Coal Handling Equipment in detail. Write for your free copy.

NORTHERN BUILT BETTER SERVICED BEST MATERIAL HANDLING EQUIPMENT

Northern Coal Handling Equipment for use above or below ground . . . in standard models or built to order.

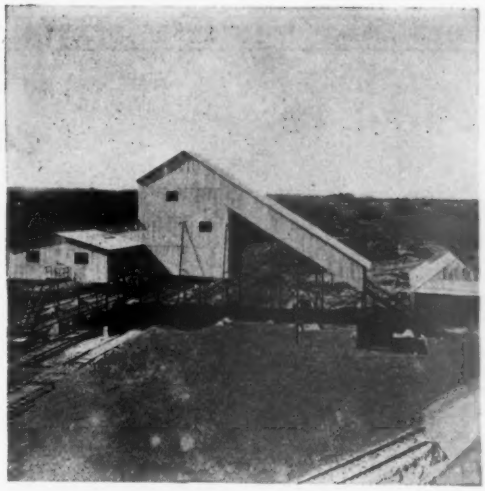
NORTHERN CONVEYOR & MFG. CO.
Dept. 80, Janesville, Wisconsin
Factory Branch: 13712 Tyler St., Detroit, Michigan
Pittsburgh, Pa. San Francisco, Calif. Cleveland, O. Rochester, N. Y.
New Haven, Conn. St. Paul, Minn.
DIRECT FACTORY MINE REPRESENTATIVES
E. M. Platts, 1215 Fulton Bldg., Pittsburgh, Pa. M. F. Bennett, 31 Liberty St., Elmgrove, W. Va. H. J. Burckart, 1177 Mulford Rd., Columbus, Ohio. L. L. Sammans, Daniel Boone Hotel, Charleston, W. Va. D. G. James, 332 S. Michigan Ave., Chicago, Ill. Paul Fitzgerald, U. S. Nat'l Bank Bldg., Denver, Colo.

Sectional Feeder or Face Conveyor.



Style B, Model 35B Pit Car Loader with 8-ft. overhang.

See us at the Mining Congress Space "G"



"UNITED" STEEL TIPPLES

Designers and Builders of Complete Preparation Plants—equipped with Screens, Crushers, Picking Tables, Loading Booms, Rescreens, Refuse Conveyors, Car Retarders, with equipment for all kinds of coal.

Let us design your next plant or redesign your present plant putting in modern machinery.

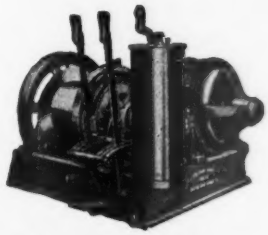
"UNITED" FACE CONVEYORS AND MINE CAR LOADERS

One of our recent purchasers writes:

"Yes, we are mighty well pleased with our purchase, and just as soon as business will justify, we will install another one."

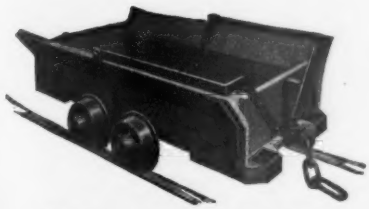
This shows how the "United" Conveyor handles lumps from face direct to mine car.

Ask for circular and information



Electric Hoists for all purposes

Please let us have Your inquires for Coal Mining, Conveying and Preparation Equipment



Timken Roller Bearing Trucks and Mine Cars

UNITED IRON WORKS, INC.

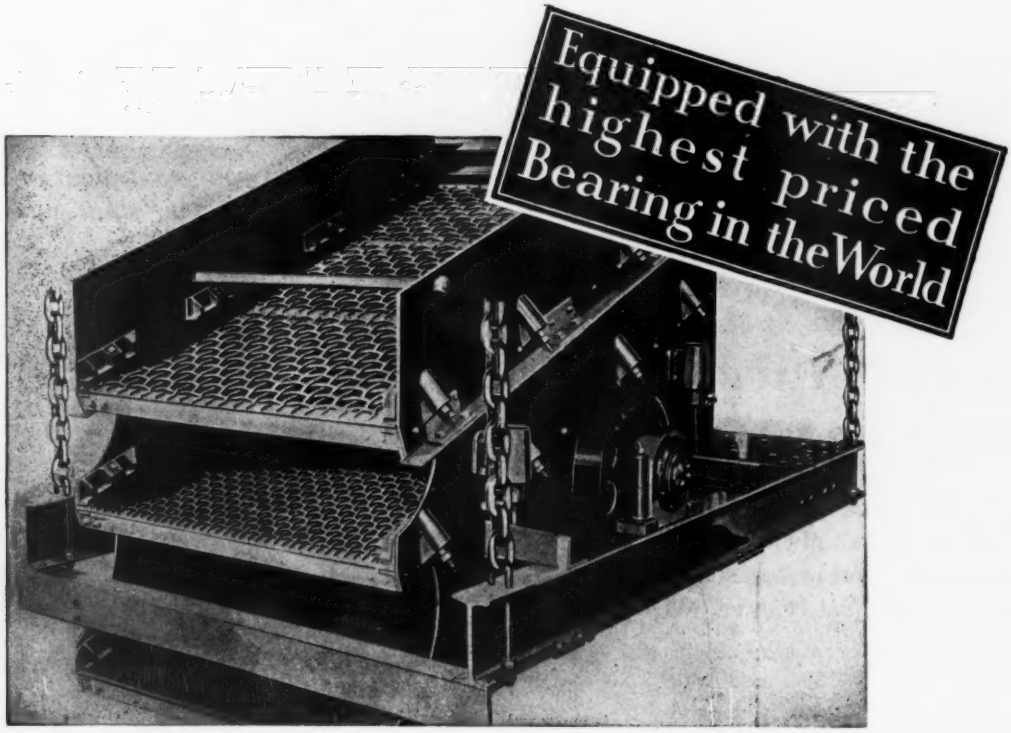
RIDGE ARCADE BUILDING, KANSAS CITY, MO.

FACTORY—PITTSBURG, KANSAS

"UNITED" IRON WORKS INC. OPEN PIT FOR SERVICE

ANOTHER MANUFACTURER IN THE MINING INDUSTRY THAT USES SKF BEARINGS

STEPHENS-ADAMSON MFG. CO.



"THE FINEST BALL AND ROLLER BEARINGS" SAYS STEPHENS-ADAMSON OF SKF

FOR over twenty years the Stephens-Adamson Mfg. Co. has been building screens which are operating successfully in many industries. And to maintain their high standards of quality they say, "we use the Finest Ball and Roller Bearings . . . safely selected for emergency overloads."

Of course, they refer to SKF Ball and Roller Bearings. These are used on the outboard journal of the vibrator screen and on the eccentric portion of the main shaft within the cross tube member. The bearings receive positive lubrication and are amply protected from dust, dirt and moisture. SKF Bearings are built to stand the heavy loads and are of the highest quality obtainable for SKF has also been guided by high standards for over twenty years.

SKF INDUSTRIES, INC., 40 East 34th Street, New York, N. Y. 2485

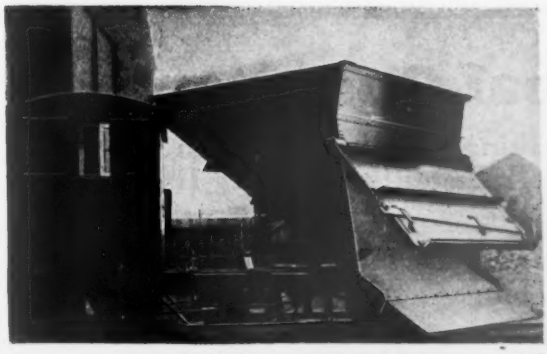
EQUIPPED WITH THE HIGHEST PRICED BEARING IN THE WORLD

Means just this

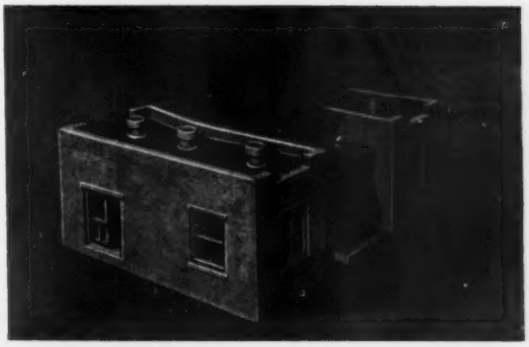
SKF

Ball and Roller Bearings

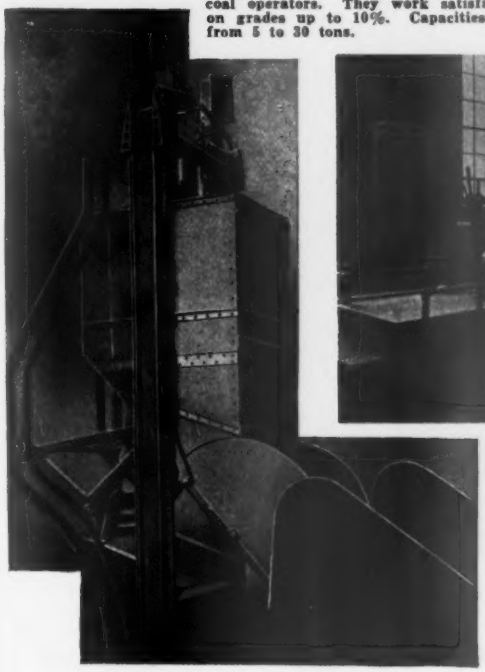
That the manufacturers whose product is illustrated above preferred to pay more for their bearings and less for servicing or replacing them. They preferred to pay a higher price in the beginning than many times this higher price in the end. And, finally, they preferred to economize by using SKF bearings because they are made to do their job, not to fit a price list.



Lepley Patented Rotary Slate and Rock Dump Cars are reducing costs for many coal operators. They work satisfactorily on grades up to 10%. Capacities range from 5 to 30 tons.



12' x 6' x ¾" casing reversible mine fan A S & R Company, Rosita, Mexico. This fan has a belt motor drive on one side and a direct connected engine drive of our own make on the other side. Capacity 300,000 cu. ft. of air per minute at 3" water gauge.



Connellsville Hoists are built to meet the individual requirements of the mines for which they are designed. They insure safety, maximum capacity, durability and dependability.

The Lepley Bottom-Discharge Skips are always in balance with each other, as the one dumping does not lose any of its weight as a counterbalance. A combined gate and chute restrains contents of skip while being hoisted and discharges from bottom into receiving chute without spillage. Opening of gate and chute gradually takes place during retarding stage of hoist. No time is lost at dumping b— This means that with same equipment, hoisting capacity of shaft is greatly increased.

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For more than thirty years, Connellsville has served the mining industry as manufacturers of Electric and Steam Hoists. Automatic Hoist Controls, Coal Hoist Skips and Cages, Car Cagers and Rotary Dumps, Mine Fans, Rotary Slate and Rock Dump Cars, Mine Pumps and Sheaves. Throughout these years Connellsville has maintained a standard of quality in all its products known and recognized by Practical Mining Men everywhere as their guarantee of service. Send for complete information regarding these and other equally noteworthy Connellsville products.

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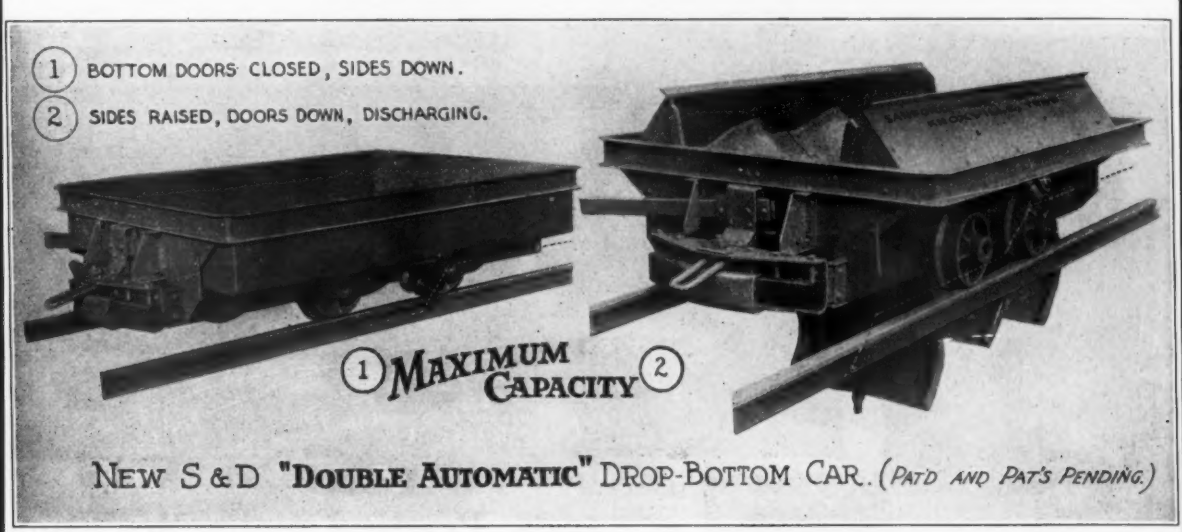

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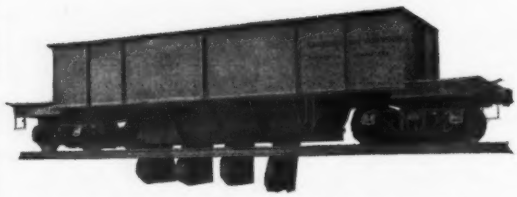

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The
MINING CONGRESS JOURNAL

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Published By The American Mining Congress**

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Editorials

The Jinx of Bituminous Coal

WHY is it that the bituminous coal industry fundamental in its importance and an absolute necessity to industry must always operate at a loss. The coal baron has been a familiar illustration in the average mind of one who easily makes inordinate profits out of a resource which is a gift of nature to all mankind. While it is true that a few coal operators by virtue of unusual business ability have been able to make money from the production of coal, it is also true that the number of men who have succeeded are fewer in the coal industry than in any other industry of comparable importance. The production of bituminous coal in this country, with two or three excepted seasons, has been carried on at a continuous loss for more than twenty years.

Our British friends do not seem to be much more successful than the operators in this country. At a recent meeting of the London Commercial Club, Mr. A. W. Archer, Vice President of the West Yorkshire Coal Owners Association made the statement that in 1928 the coal industry of Great Britain incurred a net loss of more than 9,700,000 pounds sterling. In the same year the gas industry made a profit of 7,000,000 pounds sterling. Great Britain's annual production of coal is approximately 240,000,000 tons, showing a net loss to the industry as a whole of 20 cents per ton.

The condition which so inevitably leads to losses in the production of bituminous coal is based on the fact that all of the coal for this and all future generations is now in existence and susceptible of almost immediate production. Given a sufficient price, a few years of preparation would enable us to produce a hundred years coal supply in a given year. Coal lands are worthless as such until the coal can be put upon the market and should be so considered in matters of taxation. Increasing taxes put upon coal properties force uneconomic development.

We may have no sympathy for and even less patience with the man who creates any article for which there is no profitable market, but it is a matter of vast public interest that the power resources of the nation shall be wasted by competitive conditions which force the mining of the most cheaply mined coal and the waste of the shallow seams.

Natures extra generous gift of coal reserves to this nation has been a marvelous aid to other industries by furnishing them with cheap power but has proven to be anything but a blessing to those engaged in its production. May we repeat that it is high time that the owners of the coal of this country should devise some method for the conservation of our fuel reserves, for the protection of the future needs of industry, for conditions which will permit proper wage scales, safer conditions, and a reasonable profit to the operator.

Human Initiative and the Law

THE Sherman anti-trust law was enacted in 1892. Its purpose was to preserve competition in the production, fabrication and distribution of the materials which supply the commerce of our country to which end all combinations in restraint of trade were prohibited. For many years big business was regarded with suspicion and condemnation by the great mass of our people. The necessity for cheaper production and the prevention of waste brought about consolidations of ownership through which vast production and the efficiencies created thereby served the same purpose as the combinations between individual operators which had been prohibited by the Sherman law.

After years of litigation the Supreme Court of the United States dissolved the Standard Oil into its various constituent parts but upheld the legality of the United States Steel Corporation on the ground that it controlled less than one-half of the total product. Since those decisions the holding companies have been so developed as to accomplish the purpose outlawed by the anti-trust law without technically violating its provisions. Under present conditions the chain system of doing business has made rapid progress and it is said that 65 percent of retail business is now conducted by chain stores. The present expansion of these systems could not maintain except through increased efficiency, accomplished by wholesale transactions which enable them to compete and frequently drive out of business the independent dealers, notwithstanding more economical local administration.

The incentive to private initiative, supposedly guaranteed by the Sherman Anti-trust Law, is gradually disappearing and conditions are rapidly making in which the business of the country will be operated by a few large corporations and the great mass of people forced into the employe class. Our country has secured its marvelous prosperity through the success of individuals, each managing a smaller business in an effective way. The present trend seems to be toward an entire revolution of these conditions and would indicate a necessity for a re-writing of the Sherman Anti-trust Law. The only logical argument against such revision is based on the fact that by a large distribution of ownership among the people through possession of stock of these large chain organizations the public at large can still be interested in the various lines of business which it supports and whose profit-making power is based upon the success of the individual. How this will effect the political fabric of the country is an unexplained problem which must be given proper consideration in any movement looking toward a change in present conditions.

It is hard to believe that a law which prevents small industrial units from such association as will enable them to compete with amalgamated units is a protection to the public.

Percentage Depletion

DEPLETION of mines has been one of the most important subjects of Federal income tax administration to be investigated and considered by the staff of the Joint Committee on Internal Revenue Taxation. This subject will be one of the first to receive the attention of the Joint Committee and of the Committee on Ways and Means in their future consideration of revenue revision and income tax administration.

The preliminary report by the staff of the Joint Committee, which was issued last year, outlined with considerable detail methods of valuation and accounting by which allowances for depletion are determined and used in the adjustment of tax liability of mine taxpayers. Stripping this report of statements and conclusions that are controversial and speculative, it will be found that there is clearly shown limitations and defects in the present system that can be cured only by legislation. One important defect is the failure of the law to provide for revaluation of a mine and allowance for depletion on mineral reserves that were not included in the original valuation due to the impracticability or impossibility of accurately estimating and valuing reserves or full contents of the mine at the basic date. So that a gross discrimination arises between mines, the mineral contents of which could be accurately measured at the basic date of valuation, and those in which because of geological and other conditions, the mineral contents and values could be measured accurately for only a few years in advance of actual mining operations.

An important limitation that is fundamentally in conflict with the true concept of depletion is that under the present interpretation and administration of the income tax law, the allowance for depletion is cut off when the valuation or other basis is exhausted, although the mineral is not exhausted and the mine is still in operation with a substantial supply of mineral reserves available for future operations. The value in place of such mineral reserves is essentially property and not income, and should be so recognized under the income tax law; otherwise, to the extent that this value in place is subjected to income tax when the mineral is mined and sold, the tax is not a true income tax but a property tax, the same as the tax levied by the states under their property tax laws when such mineral values are developed and assessed for state and local taxation purposes. In this respect depletion is fundamentally different from depreciation. The distinction is clearly defined in the recent paper by Dr. L. C. Graton, of Harvard University, on percentage depletion as follows:

> **"*Depletion applies only to real property.* Of importance also is to recognize that whereas *depreciation* means only reduction in value of the property, *depletion* has a more fundamental significance—it implies an *emptying*, a decrease in *actual quantity* of the property, and of the most tangible and genuine kind of property at that, *real* property. Thus a city lot may decline in value, without any change in the law itself, if the neighborhood becomes undesirable. A machine may depreciate in value, without any loss of parts or perceptible loss of substance, if it performs its functions less effectively than before. But a mineral deposit suffers depletion only by permanent removal (and virtual destruction) of the deposit itself, in part or entirety."**

The report of the staff of the Joint Committee proposes a plan for computing the annual allowance for depletion of mines at a rate of 33 1/3 percent of the net income from the mining property, such allowance to continue during the operating life of the property. The report holds that this method is desirable in order to simplify the administration of depletion, eliminate all controversies over valuations, remove the causes for inequalities and discrimination as between taxpayers in the same branch of the mining industry and in different branches, and to give to all taxpayers alike a fair and reasonable allowance for depletion of their wasting assets.

The Canadian Government has had in force for a number of years a percentage of net income method for computing the allowance for depletion of mines. Recently, the Canadian authorities decreed that the allowance should be 33 1/3 percent of the net income in the case of metal mines, and also, that stockholders in mining companies shall be allowed 33 1/3 percent of their dividends for mining companies as a deduction in determining the amount of income from dividends subject to tax. The United States cannot well afford to apply to mine taxpayers less favorable measures of income taxation than are applicable in Canada where the mining industry, although in its infancy, is growing by leaps and bounds. The issue is one that should command the most careful and intelligent thought throughout the mining industry as well as in Congress until it is definitely and satisfactorily disposed of.

Mounting State Taxes

IT is hard to believe that the total burden of taxation—Federal, State and Local—is as great today as it was in 1920 with Federal war taxes still in force. In 1920, the Federal Government collected $5,400,000,000 in taxes, while state and local tax collections amounted to about $3,200,000,000. Reverse these figures and you will have the approximate tax collections of Federal and state and local governments for the year 1930. In other words, Federal taxes will amount to perhaps a little under $3,000,000,000, while state and local taxes will be something over $5,000,000,000.

The taxpayer has not benefitted at all by the Federal tax reduction of the last ten years. It appears that the load merely had been shifted from his right shoulder to his left, which makes it less convenient and more irksome to carry. Generally speaking, the taxpayer has not been doing very much about it. The cost of running the government is being pyramided right under his nose, in his home town, county, and state, where presumably his vote and influence have the greatest weight. The taxpayer appears to have overlooked and ignored the fact that there is a close relation between increased taxes and public indebtedness. The way has been opened for extravagant borrowing on the part of states, counties and municipalities, and of course wasteful spending naturally follows.

Unfortunately, the taxpayer, instead of organizing to cure these ills of public administration, has given his support to measures to shift the burden upon industry or upon a minority class that already is overloaded. The taxpayer should make the public business his business. He should scrutinize every bond proposal and plan to use the public funds. He should not permit larger bond issues than necessity and efficient administration require, and should insist upon efficiency and honesty in expenditures. Collectively, he can prevent waste and extravagance in public administration. With proper organization, he can become master of what is at present a disheartening situation.

Industrial Equality

THE slogan "industrial equality" is used by many people who have no conception of its practical meaning; and who apparently believe it means to put a higher tariff duty on all the things the farmer produces and to reduce the tariff on the things he must purchase. This, according to the theory of protection would wreck the industries which furnish markets for farm produce and leave the farmer with unsold crops. What the farmer needs is a market in which his produce can be sold at a profit.

To maintain such a market requires a practical control of production to meet probable consumption. If the Federal Farm Board can accomplish this purpose, it will be a boon to the country. This purpose will be served by proper crop distribution and orderly marketing.

The market itself must be maintained by hungry people who earn sufficient wages to enable them to buy the things they need. The requirement of the farmer is for increased industrial activity to create purchasers for a continually increasing farm output based on better farming methods.

More farmers with better farming methods and industrial stagnation with its decreased consumption will bring ruination to the farmer. More consumers and less farmers will solve the marketing problem and give the farmer industrial supremacy. Continually expanding industry with bigger payrolls which cannot exist without proper tariff protection will absorb the increasing farm production based on better methods and this condition only will bring industrial equality to the farmer.

The American System

THE critics of tariff protection base their opposition upon the allegation that tariffs increase the cost to the consumer and that in consequence the tax levied upon the import of any article is to that extent a tax upon the consumer of that article. This theory is not justified by the facts, because many articles sell in the open market for much less than the cost, plus the tariff charges.

Fundamentally the ability to buy is very much more important than price. The wage earner, who is continuously employed under a high wage scale, is not concerned about the price if, after satisfying his needs, he has a surplus left which can be used for saving and for luxury.

The Government, which creates conditions under which a wage earner may meet his necessities from a part of his earnings and leaving a surplus for such use as he cares to make of it, has accomplished a great industrial purpose.

The price of commodities fluctuates under the law of supply and demand. Increased production, made possible by the use of machinery, makes possible, not only a lower price but also a larger wage scale, and more of comforts and luxuries to all consumers.

From the industrial standpoint the crowning virtue of our Government lies in the fact that our wage earners enjoy more of luxury than is enjoyed by the workmen of any other country in the world.

In the United States a large percentage of wage earners own their own homes; in Europe the workman who owns his own home is most unusual. In Europe the average laboring man has a new suit of clothes once in several years; in the United States our workmen average two suits of clothing yearly. In the United States we have 40 labor banks with over $200,000,000 of capital and 600 colleges with more than 800,000 students; in Great Britain there are no labor banks and the number of college students is approximately 40,000—and yet notwithstanding these comparisons, there are some people who believe the system or systems, which have created these conditions, should be abolished.

The maintenance of a high wage scale, big business and mass production are the distinguishing features of the American system, and while none of these are free from criticism, taken as a whole, they stand the test as effectively as the Sermon on the Mount.

And Again—Cincinnati

IN the minds of the coal industry the word "Cincinnati" has come to have a much greater meaning than that of a mid-western city. It represents the greatest opportunity offered to the industry each year, to bring itself abreast with the rapidly growing tide of efficient production, safety and cooperative effort.

For at Cincinnati, each May, for the past seven years, coal operators have congregated in large numbers, have exchanged ideas, and have had displayed for them a magnificent exposition of equipment and supplies. Nowhere is there such an assembly of the operating personnel of an industry, and a presentation of efficiency-producing equipment with highly trained men whose sole aim is to explain how it may be adapted to production problems.

This meeting offers to the operator—which includes everyone concerned with the actual production of coal—an unusual opportunity to gain up-to-the-minute information upon such important subjects as mechanization, accident prevention, personnel training, and all other phases of their problems.

The meeting scheduled for the week of May 5, offers a wonderful opportunity to listen to papers presented by the best minds in the industry upon every phase of operation from blasting at the face to putting the coal into the railroad cars; to see the most magnificent display of equipment yet assembled; and to renew friendships, for every indication points to an attendance far in advance of other years.

The Cincinnati meeting is the most excellent example of the dawn of a new day in coal, the beginning of real cooperation between the various fields, companies and individuals.

The dates are May 5 to 9. The place is Music Hall, Cincinnati; the sponsoring organization is The American Mining Congress.

The Exposition

ONE HUNDRED AND TWENTY-FIVE of the leading mining machinery firms will participate in the National Exposition, held in conjunction with the Convention of Practical Operating Men, under the auspices of the Manufacturers Division of The American Mining Congress, at Cincinnati May 5 to 9. These concerns will have on display the latest models of their equipment; they will have a corps of highly trained men in charge of their exhibits, who will be at the service of the industry in explaining how coal production may be made more efficient.

Everything that enters into coal production will be shown, and many new devices will appear. A number of the exhibitors are planning exceptionally interesting booths. This yearly event is the manufacturers' opportunity to "introduce" new equipment, to bring out for the first time improvements in their regular line, and at the 1930 show 21 manufacturers have announced their intention to present something entirely new.

The exposition in itself is a tremendous educational factor in the industry, but taken in conjunction with the convention, the opportunity offered is truly exceptional.

The Young Man and the Coal Industry

FOR some time it has been apparent that there is a growing slackening of interest in our younger generation in the opportunities presented in the coal mining industry. Fewer and fewer young men are choosing this industry for their life work. The mining schools have been doing everything they can to remedy the situation, but the difficulty does not lie in the school. A movement started sometime ago by The American Mining Congress, looking to a greater cooperation between the mining school and the mine operator has stimulated interest, and a committee has been studying the situation from various angles.

Of the young men now employed in the industry what percentage is full of enthusiasm for their future? How many of them are dissatisfied, and on the lookout for places outside that will hold greater apparent prospects? Certainly that percentage should be small, but is it?

There is one way in which the individual coal company may insure this enthusiasm—the enthusiasm that builds industries—and that is to send the young men in their employ to Cincinnati during the week of May 5, there to gain in knowledge, and in inspiration. If any large number of companies do this the effect upon the industry is bound to be pronounced, and eventually the industry as well as the company will profit.

Utilizing the opportunity offered at this great convention and exposition is the duty of the coal operator, and to use it to its ultimate capacity will insure the solving of many perplexing problems.

The convention and exposition are great educational factors. Make them pay real dividends.

The Sugar Tariff

IT is not a new thing to hear that law which protects our high wage system called a "robber tariff." To the man who thinks only of what he has to pay and gives no thought to the means by which he is able to pay, all tariffs are unconscionable and unless tariff laws are so framed that they create advantages, either directly or indirectly for every person who works for a living, the highest purpose is not served.

Every section of the country is more or less dependent upon the prosperity of every other section and while the consumer of sugar, and perhaps no product is more universally used, would be pleased at a low price yet it would seem, and the history of this country justifies that theory, that he is better able to pay seven cents per pound for his sugar if the several cane and beet sugar states are prosperous than he would be to buy that sugar for five cents a pound with several states in bankruptcy and unable to consume the product of the sugar consumer. The special session of Congress was called for the particular purpose of lending aid to the farmer.

Upon no one item and in no particular is there greater opportunity for aiding the farmer than in the development of a sugar industry in the United States which is able to supply a larger part of our consumption. It is estimated that the asked for increased tariff on sugar if passed on to the consumer will average 32 cents per year for each person.

Our total consumption of sugar is about nine billion pounds. We import from three to four billion pounds of sugar from our insular possessions duty free. We import from Cuba about six billion pounds at a preferential duty 20 percent less than the regular rate paid by other countries. We produce about two billion pounds.

If the tariff rate could be so fixed as to permit the United States to raise 75 percent of its consumption, it would mean that the States of Colorado, Utah, Michigan, Idaho, Montana, California, Ohio, Louisiana and Texas would have about $180,000,000 more with which to buy goods. The farms so used would not be in competition with other farm products in the markets thus created. This alone would almost solve the long standing farm problem. It would add largely to the purchasing power of the farm produce markets and take out of competition millions of acres now devoted to the cultivation of ordinary crops. No one thing would do more for the farming industry of the United States than to enable it to produce to its limit beet sugar to supply our own domestic market.

Silver and Subsidiary Coinage

MORE than one-half of the world's population are users of silver as a medium of exchange and value. India has long been known as the sink hole of silver. Surplus crops in India lead with certainty to large purchases of silver and the surplus wealth of India is hoarded in taels, ornaments and bullion.

A great part of this silver was purchased at a price considerably above $1 per ounce. Before the great war the monetary stock of silver in India was $239,959,000 and it is estimated that the people of India are hoarding silver to the extent of five billion ounces. During the war India willingly paid the United States $1 per ounce for 208,000,000 ounces of silver taken from the Treasury of the United States. This sale by our Government was made under the stipulation which required the replacement in the Treasury of a similar amount of silver purchased from the silver producers of the United States at the price which was received from Great Britain. For a short time these purchases resulted in stimulating the silver industry of the United States.

After the war, the sale of silver to Poland and the apparent promises that silver would gradually be brought back into use as a subsidiary coinage in gold standard countries advanced the price of silver to a point where its production would not become a burden to other minerals with which it is associated in the complex ores of the West.

The growing use of credit money based on the gold standard has taken from silver much of the demand for its use as subsidiary coinage; and the net results of all these influences has been to depress the price of silver to the lowest point in history.

It is not the function of Government to legislate prosperity into any line of business. It is the duty of Government to provide a stable medium of exchange in an amount which, so far as possible, will hold price levels on a normal basis.

Can this be accomplished without the use of silver in subsidiary coinage? A contraction of gold reserves as compared with business transactions seems inevitable. The extended use of silver in the Far East and its use as subsidiary coinage in the gold standard countries seem to offer the only defence against future agitations for greenbacks and other unsound money mediums.

Mine Census

THE need of no industry is greater for accurate statistics, than that of the mining industry. The present effort of the government to include in the 1930 census complete and accurate data concerning the mines and quarries of this country is worthy of the complete and prompt support of those industries. We urge the hearty cooperation of mining men generally, in furnishing the Census Bureau with the data they have requested, so that the information will not only be timely, but will reflect condition of the whole industry.

The old wisteria covered ampitheatre at Arlington National Cemetery

Analytical Valuations *in* Income Taxation of Mines

By R. C. Allen

Vice President, Oglebay Norton & Co.

THE subject assigned to me—"Analytical Valuations In Income Taxation of Mines"—is in reality pretty nearly the entire tax subject; the use of analytical appraisals in determining the sum subject to depletion is the nub of the difficulties complained of. The proposed percentage of income method of determining the deduction rests for approval on alleged inadequacies of appraisal as a fair measure of determining allowable depletion. The contention is that difficulties in determining by appraisal the value of minerals in the ground justifies a change to the simple expedient of setting aside a fixed portion of the annual income as the depletion allowance. It may be noted in passing that this fixed portion of the income represents in the proposed plan an average by classes of the sums determined and heretofore allowed through use of analytical appraisals. Any discussion of depletion, as now defined, turns on the amount allowable; under present laws and regulations that amount is the value of mineral in the ground as of specific dates (basic dates) and such determinations, as a practicable matter can be made, in most cases, only by the use of so-called "analytical appraisals."

Inasmuch as the value of property in general, including mines, for one purpose is not necessarily and, I may say, not usually its value for every other purpose, I limit my remarks on analytical valuations to their use in determining the value of minerals in the ground for taxation. For this purpose they were in use long before the Bureau of Internal Revenue had any use for them, by several of the states, mainly for ad valorem taxation. They were also in use by industrialists in every-day commercial affairs as well. Were analytical valuations not under attack here today, at least by implication, the remarks that I am about to make could be dispensed with, but the argument for percentage depletion has, I think, placed undue emphasis on the alleged inadequacy of appraisals as a basis for determining the depletion allowance.

What is value? The economists say that in the last analysis the value of anything (a good) is the present worth of the income to be had through its use. The definition is general—applicable to any property, whether it be a farm, house, mine, or diamond ring; and it makes no difference whether the expected income be measured in dollars or in the mere satisfaction of having the coveted possession, as, for instance, a wife, or a good character. One buys stock (or should) on his or some one's else estimate of its probable earning (income), or a farm, a house, or a car. And so does the value of a mine rest on the buyer's or some one's else estimate, at the time, of the income to be realized from its exploitation. Of course, that estimate is subject to change in the course of events, and so are similar estimates of the probable productiveness (income) of other property as, for instance, farm land, building lots, apartment houses and ships. It is because the value of many mines changes more radically in the course of time than other forms of real estate that valuations of this kind of property are commonly thought to be unreliable. If a mine was valued five years ago at $1,000,000 and today at $10,000,000 it does not follow that anything is wrong with the method of determining the value or that the persons making the determinations were incompetent; the valuation of the property we may presume has actually changed by the difference between these figures. It is this instability of the value of a mining property that gives rise to much misplaced criticism of sound work by the most competent valuation engineers. If the engineer could estimate with precision expected income and its rate of realization, we would have had no discussion such as we have here this morning; but the engineer can not do that, even though he can do it better than anyone else. No one can estimate with precision the value of an expectation.

There are certain classes of mines, nevertheless, as to which the expected income and its value can be determined with fair approximation. Into this class fall the great mineral deposits susceptible of measurement, if not to their physical limits at least to the point of assurance of long operating life. Into this class fall also many smaller deposits with shorter operating lives, fairly determinable by reference to known limiting geological conditions. But there are also many mineral deposits of divers types that are not subject to approximate measurement because the geological factors are either not revealed or not understood. Many of these deposits have been productive for many years, but never have had, and do not now have, more than a short assured operating life. It is this class of mineral deposits that makes most of the trouble for the Government and the taxpayer. The valuing engineer properly assigns a relatively short operating life to such mines and a corresponding value, but the taxpayer having a mine of this type, which appeared to be short lived, say, on March 1, 1913 (and was so valued for depletion), who is still operating that mine (although his allowance for depletion has been exhausted or soon will be exhausted) and has in sight many years of assured income from it, of which no account was taken, or could have been taken, as of March 1, 1913, feels that he has been badly used. He may have sought relief under the discovery clause of 1918 to no avail; he may have failed in an attempt to show gross error in the estimate of value and failed in that, and having found every avenue of relief under the law and the practice of the Bureau of Internal Revenue closed to him he joins with other taxpayers similarly situated in demanding relief through legislation. That, I think, is the proper course for him to take, for the valuation of the property by the Bureau of Internal Revenue may be assumed, as a general matter, to have given him all that the law intends that he should have.

We are now at the nub of the question. The law and regulations say to the taxpayer it is intended to tax your income since March 1, 1913, but not your capital, which is defined as the money's worth of

The old wisteria covered amphitheatre at Arlington National Cemetery

what you then possessed; estimate the amount of your capital and make a record of it, we will check the estimate, decide on the value and arrange, through proper accounting methods, to permit you to deduct that amount in yearly installments from your income, or what remains of it in a lump sum in any year, in which you dispose of what remains of the corresponding asset; but when you have exhausted the amount the deduction ceases. That seems a fair intention, but in carrying it out there arises, in the case of mines, difficulties of a practical nature, as we have seen, in coming to an agreement on the value of certain types of mining properties.

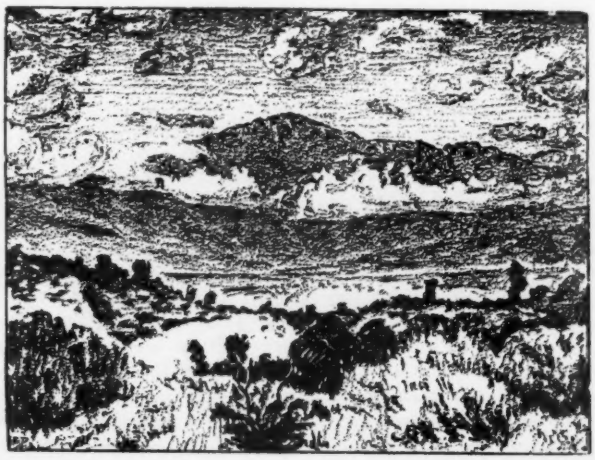
These difficulties do not arise under ad valorem taxation of mines as administered in Michigan, Minnesota, Wisconsin, and perhaps other states. Instability of mine values is no menace to the system, because the values are redetermined from year to year and each property is taxed on its worth (or fraction of it, as required by law) as other forms of real estate are taxed. The valuing engineer is not required to attempt the impossible, to measure the whole income to the end of the operation and the rate of its realization. He is required only to determine approximately the value which the property would command in the event of sale under average, normal conditions. That is the test commonly applied in assessing other property for ad valorem taxation, and is also the test contemplated, I think, by the Federal income tax law in determining the value for depletion. But, unfortunately, under the income tax, the appraisal once made must stand (in the usual case), and that is at the root of the taxpayer's complaint. It is not enough that the Government, recognizing that the benefit of the doubt belongs to the taxpayer, attempts to avoid undervaluation; these taxpayers claim the right to deduction for depletion with respect to each unit of mineral produced, regardless of when it was discovered and regardless of whether it could, or could not, have been comprehended in valuation for depletion as of a basic date. What they want is nothing less than perpetual depletion universally applied. If that is what we are coming to, we had better abandon valuation as a basis of determining the deduction.

Taxation of income derived from mining at rates lower than those applied to other incomes would be simplicity itself. Congress was moving in this direction in 1918 when it extended the depletion deduction to income derived from oil wells and mines discovered after March 1, 1913; but the appraisal or unit method of determining the deduction was retained, which, of course, placed a limit on the total sum allowable. In the case of oil, Congress subsequently removed the limit of the total allowable sum, did away with the appraisal or unit method of determining the deduction and fixed it arbitrarily as a portion of the annual income. This is perpetual depletion.

Some of us opposed the discovery provision in 1918 because of its bunglesome and unscientific method of expressing a sound idea. Mr. Axel Ramstedt, whose paper you have heard, and I were then in the service of the Bureau of Internal Revenue. I then made the suggestion (and I think Mr. Ramstedt concurred in it) that we take a firm hold on the dilemma and boldly advocate that income from mining should not be subject to the full rate of taxation applied to other incomes; for we were involved in the administration of the income tax and could foresee well enough the interminable difficulties into which the Bureau of Internal Revenue was about to be plunged in trying to administer depletion under the discovery clause of 1918. That clause set us all conjuring as to what is a mine. Try yourself to define that word under the general purport of law. You will probably conclude, as we did, that it means a mineral property that can be operated with profit. But how much profit? Within 30 days after discovery of mineral that will return a profit the mine must be valued, even though the profit be negligible. The Bureau of Internal Revenue has a perfect right to adopt that view, but if it did there would be no relief under the clause. The law itself is meaningless, but the bureau has done the best it could to give it a rational interpretation. Who can tell just when a mine is discovered, and in all cases whether the discovered ore is, or is not, somewhere, in some way, connected with a previously known ore body. Such attempts too often make rascals of us. In order to avail ourselves of the relief presumably intended we are forced into all sorts of inconsistencies.

If we could substitute for the absurd and unworkable provision for depletion in case of discovery the percentage of income plan or, better perhaps, could the percentage of income plan be set up in the law, to be availed of at the option of the taxpayer (and when so availed of all other forms of depletion to be abandoned), the administration of depletion would be simpler and complaints of unfairness and discrimination would perhaps be finally quieted. I doubt, however, that the American Mining Congress, a national organization representing the industry as a whole, can sponsor the proposed legislation. There are many important groups of taxpayers who have nothing to gain from such an amendment and rather fear that a reexamination by Congress of the whole subject of depletion may result in legislation that would narrow and restrict the deduction now enjoyed.

Mr. Armitage put his deft finger on the difficulties which may beset the application of that doctrine as of this date. They are of an intensely practical sort, because they seem to require that income from mining be preferentially treated. I had hoped to hear a clear justification for the preferential treatment desired, as well as the method of extending it, which has been so ably presented. Although the position of Messrs. Graton and Ramstedt commands sympathy, I am sure, from all those who pay taxes on income from mining, I fear that the weight of opinion will be opposed to the percentage of income plan unless it be optional with the taxpayer. The taxpayer should not be compelled to abandon settlements made under existing laws and regulations; that would be unfair, and any such attempt would alienate the support of important groups of taxpayers, owning large and valuable properties, who are involved in no situation requiring the abandonment of appraisal as the basis for determining depletion.



In conclusion, I think it only fair to say that the valuation engineers of the Bureau of Internal Revenue, working against tremendous difficulties, have accomplished all that it is possible for humans to do in their situation. I know from experience that the way of the tax gatherer is a hard one. These men are to be congratulated on their devotion to difficult and trying duties and for the skill with which they have handled their work.

The Metal Industry and the MINING SCHOOL

*By Milnor Roberts**

THE need for cooperation between the technical college and the operators in the industry exists more strongly in metal mining than in most other industries. Some of the reasons for this need will briefly be indicated, for the purpose of calling attention to them and thus leading to discussion of ways to bring about a clearer understanding between those who train young men as engineers and the operators who later employ them.

In the first place, in metal mining the operations are extremely varied, and it is correspondingly difficult to train each student to meet all the demands that may be made upon him. The points of difference between dredge mining for gold, underground mining for silver, and open-pit mining of porphyry copper ore, are almost as numerous as their points of resemblance.

Then, too, the mining operation often takes place at a point far distant from the head office of the company, and also distant from centers of education. Under such circumstances interchanges of ideas between the three groups represented by the mine, the company, and the college, do not take place frequently or to the fullest extent at any time. The situation is quite different from that which prevails, for example, in the training of mechanical engineers. In certain eastern centers of industry a good proportion of the graduates from a technical institution may perform their life work in plants located in the neighboring region. In such a situation the changing demands of the industry are promptly reflected back upon the technical college.

A further reason lies in the fact that the operators are not a homogeneous group of men. They have not grown up in the industry under like conditions, they have never served apprenticeships of a fixed and uniform character, and, in brief, there is a marked lack of similarity in their training and in the conditions that prevail in their work. Any one is free to open up a mine and try to operate it. The laws on this phase of the business are not strict, and for psychological reasons men of the most widely divergent experiences and aims in life drift into the broad field of mining.

Although many men who are attending this joint convention at Spokane are accustomed to the ordinary conditions of hard-rock mining, we are all aware of the variety of other conditions that some of our number have experienced. Without dwelling longer on the different types of mining and the conditions attending them, it seems justifiable to say that a four-year course can hardly be expected to prepare all the graduates for all the conditions they are likely to encounter.

This gathering of mining operators and managers, smelter men, mining engineers, prospectors, claim owners, students, and others interested in the field of the mineral industry, offers a splendid opportunity for the discussion of cooperation between the operators in metal mining and the mining schools. The subject is always an important one, although during most of the year it does not crop out prominently enough to attract attention. In the spring, and to a less extent at New Year's and other seasons, a demand arises for young men who have been trained in some division of the industry. This demand assumes various forms. It may result in a call for a graduate with special training in some particular subject, such as vein deposits of lead-zinc ore. Again, openings may appear for good young fellows with all-around ability.

When a subject is to be discussed by a group of men gathered from distant quarters, not fully acquainted with one another, and having widely varying aims, the first item of importance is to state the subject that is before the meeting and to make it so clear that none will fail to comprehend it. It is a matter of common experience that, when a knotty problem arises, it seems at first to bristle with difficulties, but as we look it over from different angles and try to analyze it, we may find that some of the most awkward points disappear, and the remaining ones become less formidable when they are clearly set forth. Unless we inform each other at the outset of the important features of the subject before us, and then ask questions, state new facts of interest, and express our opinions, the discussion may degenerate to the grade of those that take place in Pullman smokers, where the loudest talker wins, and some retiring man who really has ideas, refuses to present them, and steps out on the rear platform for a breath of fresh air.

Any man who has had 15 or 20 years' experience in business could make a rather definite statement as to what he would not expect in a young man just entering his employ. He does not hope to depend upon the youth as an expert in many lines, although he may prove skillful in one or two. Neither does he expect his new assistant to possess a broad knowledge of the markets, nor a keen sense of the current situation in business, for such viewpoints are attained only with years. He does, however, expect that the young man has spent his time to advantage in whatever former situation he may have been placed, whether he began as an office boy, an accountant, a laborer, or an apprentice in some trade.

I mention the case of a young man who has not had college training because it is the more usual one, and because it suggests certain principles that apply to the employment of college-trained men. In both groups there is wide variation between individuals. Some boys show expertness even in their school days, and follow a hobby with great zeal. Many a youngster of today is quick at taking down the engine of his car and assembling it again. Such a boy will be skillful with machinery whether he grows up in the shop or in the laboratory. On the other hand, some boys prefer more general training; when a lad of this type finds the broad opportunities that are offered him in a college course, he gains in judgment and widens his outlook as he progresses. I am now merely pointing out the individual characteristics in the types of work. One who has specialized on these types would produce better results, other factors being equal, than one who has been trained with a different object in view.

* Dean, College of Mines, University of Washington.

Presented to Western Division Meeting of the American Mining Congress, October 1, 1929.

Recognizing that each of the different types of mining operations calls for special preparation in the individual, one would expect to see care bestowed on the selection of men for particular positions, but far too often this step in the business is a haphazard one. The better organized companies and the successful individual operators not only use care in such matters, but some of them go even further and maintain courses of training for cadets in their service. For example, the Phelps Dodge Corporation and the United Verde Copper Company at their Arizona mines put the young engineers who enter their employ through a course of local training under the experienced men in each department. An official of one of these companies recently told me that the only drawback to the plan is that the young men become so thoroughly trained that their services are in demand by other companies.

When positions are to be filled we can not make men to order for them, but must accept people as we find them. It should be remembered, however, that a young man's usefulness is moulded by his education and training. An engineering education provides one with edged tools, and these should be used for their special purposes. We would not select a carpenter's chisel and mallet for drilling hard rock, and yet such an attempt would not be any more unreasonable than to expect a young man trained solely in civil engineering to take hold of a mine or prospect, develop the known ore-bodies and search for new ones. Nevertheless, mismating of this character is constantly taking place.

Numerous instances could be given of men with unsuitable training who have made a success of mining, but no one will deny that these men might have made still better progress if they had been educated especially for the work they have been called on to perform. Perhaps we should here make a distinction between the technical features of mining and the buying and selling of properties, the raising of funds for financing mines, and other transactions that are mainly financial in their character.

Certain of the reasons for misfits in mining are not hard to discover. Mining takes place largely at points distant from centers of business. The day's work and the policies followed at a mine are not subject to such public scrutiny as covers, let us say, the erection of a building in a city. When a building is to be put up, the plans and specifications for it are drawn according to established standards; they are then presented to city officials for inspection, and made to conform to the civil ordinances. When the building is erected, the plans thus carefully adopted are followed with more or less exactness, and the work is done by experience mechanics under inspection by the city and also by representatives of the owner.

In contrast to this well-guarded practice in building construction, and the expertness with which many mines are handled, is the loose situation that sometimes prevails at a property. A group of doctors decides to make some quick money while copper is up. A friend of theirs knows of a likely prospect, and a committee consisting of three of the doctors inspects it and approves its purchase. Some members of the group insist on employing a mining engineer to examine the property. His report is read with interest and is referred to for several years afterward, although the data available to the engineer at the time of his preliminary examination may not have warranted the giving of such weight to his findings. Some of the doctors consider that they have done their full duty to science and engineering when they employ an examining engineer, and thereafter they propose to run the mine in a thoroughly practical way. One member of the committee of three has always been a practical fellow himself, as he admits, and he volunteers to act as managing director and make frequent visits to the property. This director has a friend of long standing who has tried his hand at a number of different lines of business and is ready to enter upon a new one—a fact that indicates about how much success he has already had. Under the direction of these two men the company in the next two or three years spends a good deal of money, opens up considerable ground, and erects several buildings.

At this stage it seems desirable to employ a technical assistant for the superintendent, inasmuch as not much ore has yet been found and each doctor who visits the mine expresses a different opinion as to where search for ore should be made. A young graduate is engaged, without considering the nature of his training. It happens that as a student he specialized in ore dressing, and had no underground experience. He becomes interested in working out a process for treating the ore, but is not well qualified to conduct a search for ore. And so the mine runs along, with one botch in the management after another, and no control of the operation by any competent authority.

If this paper were being written for a popular magazine, I could give instances of mismanagement that were more flagrant than the one I have just described. Full details of some of them would make interesting reading, although they might prove harrowing to the stockholders. In a gathering of mining men, however, it is only necessary to quote an ordinary case for the purpose of illustration. We have all seen examples that amused us, but such misfortunes reflect no credit on our business, and they make it that much harder to raise money for legitimate mining. Incidentally, these cases grate sorely on the instructors who have at heart the careers of the young men they have trained.

In order to have both sides of the subject before us, let us now consider the nature of collegiate training in mining. Within moderate limits the curricula are much alike throughout the United States. Standardization has been aided by widespread discussions that were carried on over a period of years in the technical press and in the mining societies. The fundamental courses in general engineering, in the sciences, and in language do not vary greatly, but in different parts of the country the character of the technical training given in the two upperclass years shows considerable variation.

In the above-mentioned discussion of the curricula, the ideas of the operators were sought and were given full weight when the courses were selected. As would be expected, the suggestions received from men who held positions varying from those of technical experts to managers, and who were engaged in lines of business that ranged from the individual working of a gold placer to the operation of a huge iron mine, varied widely. Just here a distinction should be noted between the three groups of operations that may be classed as mining proper, ore dressing, and metallurgy. We are most concerned with mining itself, but, in the West especially, the distinctions should not be drawn too closely in a discussion of this character, as the three subjects are frequently interdependent.

All students in the various four-year curricula that fall under the general headings of mining or metallurgy have certain studies in common, especially in the first and second years of college. In many institutions the curricula are exactly the same in all the divisions or options for the first year. The second year may be the same for all, or it may show a variation of greater or less extent. In the third year the variation becomes more marked. Certain courses are still common to all the options, but it is in this junior year that the student plunges into his chosen specialty.

The fact that variations in the curricula and specialization begin in the third year makes it desirable for every student to gain practical experience at the end of his first or second year. At the University of Washington we require such practice and the results have fully justified the scheme. Some of our most successful graduates are those who

worked in the same district during successive summers of their college course and discovered for themselves the kind of training that they needed to handle the problems of that district. Operators usually take a personal interest in boys who show this much initiative, and give them preference for positions after graduation.

The junior student not only studies the technical subjects that are in order at this stage of his training, but he also elects courses in other departments that will support his main line of attack. For example, a junior who is interested in management and the business side of operating would look over the schedule of the department of business administration and, perhaps, select the fundamental course and the course in accounting, to be followed in his senior year by the course in business law.

In their senior year all the students have a few courses in common, for instance, ore dressing, metallurgical analysis, economic geology, structural engineering, and an analytical study of the operations at some typical mines, mills, and smelters. The exact names of these senior courses differ at the several institutions, and the nature of them also varies, but the prevailing idea is to give the graduating students final coaching in the technique of their profession, and also to present a survey of the whole field of the mineral industry as it appears to professors who devote their lives to the special task of studying the industry and giving instruction in it.

Instruction in most of the courses is given by lectures and recitations in the classroom and by practice in the laboratory. The equipment available and suittable for instruction purposes has improved greatly in the last few years. At the University of Washington the new building known as Mines Laboratory, which was completed only last year, has very full equipment for all the courses in mining, metallurgy, and ceramics that the College of Mines offers. To experiment with such up-to-date apparatus is a pleasure to both instructor and student, as well as to the mining men who also make use of the laboratories. The United States Bureau of Mines maintains its Northwest Experiment Station at the college and conducts its investigations in Mines Laboratory.

In addition to the training given in classroom and laboratory, the junior and senior classes are taken each spring on an excursion to mines and plants where arrangements have been made for the party to study the equipment and the operations. In a typical case the class goes to a mine, stays at the boarding house, and adopts such hours for inspection as prove most convenient for the management of the mine. Usually at the start, the mine geologist exhibits a map of the region and explains the general geology, following this outline with a description of the local geology as it appears on the mine map. He then describes the ore occurrence and outlines the manner in which the mine was developed. The class then spends a few days underground, studying and making notes on the ore occurrence, the plan of exploration followed, and the methods of mining used. Next in order come the treatment plant, the hoist, and other surface equipment. A week's time may be devoted to a single large mine, or the excursion may include several mines in a district, but to avoid confusion the number of properties visited is closely limited. Other excursions of a like nature are made to smelters, steel plants, power plants, and other industrial works that illustrate engineering practice.

At this point it is fair to call attention to the fact that the colleges do not limit their efforts to the four-year course, from which young men graduate in their early twenties. A very few of the institutions offer a six-year course, and all of them invite graduates to return for one or two years of specialized study. At 10 institutions, including the University of Washington, fellowships are offered by the institution for cooperative work under joint direction of the college and the United States Bureau of Mines. The holders of these fellowships are selected technical graduates who have enough interest in their professional education to carry on investigations for a mere living salary, in order that they can continue their studies.

The question often arises as to the extent to which a student should be trained as an expert before graduation. If we assume that a broad foundation is needed for technical courses that must be as varied as those in mining, then the time available for the intensive practice needed to produce an expert is very limited. Similarly, the number of details that can be taught to advantage is a question to be settled with care, lest the minor points crowd out those of major importance. The airplane is being used as an aid to prospecting, therefore, a demand may arise in mining for instruction in flying. One of our graduates pilots his own plane to the distant mines in Yukon Territory that are under his direction. But however useful such an accomplishment may prove in a particular case, at the present stage of flying it would be a minor qualification for the average young man. If we were sending a scout into the field we would choose a man whose mind is on mineral rather than on wings.

Discussion of his own paper on "The Need for Cooperation Between the Mining School and the Metal Mine Operator," by Dean Roberts.

The exact title of the subject for discussion between the mine operators and the technical instructors was selected by the officials of the Mining Congress. This subject brought out the most extended discussion of the convention, showing the general interest that it holds. One of the speakers representing a college introduced a cognate but quite different question, namely, do the operators cooperate with the colleges? On this subject he presented the affirmative for a particular district. Fortunately several operators from that district who have been noted for their kindly interest in young engineers were present to speak for themselves. The success that these leaders have attained should inspire other operators to note their methods in the employment of technical men.

The extent to which the human element enters into the placing of men is a phase of the subject that was not discussed. Occasionally a student follows some major subject other than mining for a part of his college course. By some chance he enters the mining field and grows to like it. He then changes his course and graduates in mining. While such training delays the young man's progress it gives him a wider outlook, and if his combination of subjects has been a reasonable one he may prove to be an exceptionally useful man. Again, an operator finds a young fellow upon whom he can place great dependence, but unfortunately the lad's training does not quite fit the situation. Gradually, however, a place is found in the organization where his unusual ability to cooperate can be made available. Individual cases such as these do not alter the general situation that I sketched when opening this discussion.

M. C. Angloch
President, Vesta Coal Company (Chairman, Western Pennsylvania Board)

T. R. Johns
General Manager, Bethlehem Mines Corporation (Chairman, Central Pennsylvania Board)

E. H. Suender
Vice President and General Manager, Madeira-Hill and Company (Chairman, Anthracite Board)

Walter H. Glasgow
Secretary of Mines, Pennsylvania (Ex-officio Member, all Mining Boards)

Paul Weir
Vice President, Bell & Zoller Coal & Mining Company (Class of '18)

L. E. Young
Vice President, Pittsburgh Coal Company (Class of 1900)

Pennsylvania's Mineral

MINERAL INDUSTRIES in the Keystone State may be viewed from an international as well as a local aspect. No single state or country can display such a firm grip upon resources and such a valuable use of mineral products. Her fuels, lubricants, and metallurgical and ceramic products are used around the world.

Pennsylvania's mineral industries are vital to the prosperity and well-being of her people. Her industries include mining, quarrying, metallurgy, ceramics, oil and gas production, and fuel technology. If these industries were removed the industrial structure of the state would collapse and only the farmer would be left. Robbed of local markets, the farmer in turn could not prosper.

Pennsylvania's mines and products derived from minerals account for about two-thirds of the entire productive wealth of the state. The primary mineral industries alone engage 43 percent of the total labor employed in productive industries. The capital invested amounts to more than 34 percent of the capital invested in productive industries and the annual pay roll is about 48 percent of the total industrial pay roll.

Although mining only one-seventieth part of the iron ore in the country, Pennsylvania produces over one-third of all the pig iron. Countless similar examples display the tenacity with which Pennsylvania holds to the leadership in the mineral industries.

Need of a Mineral Industries School

The citizenry of Pennsylvania is slowly realizing the great economic importance of her mineral industries. Natural resources are waning in various localities in the Commonwealth and inquiries are being made as to how the limited resources can be conserved and utilized to better advantage and whether there are other mineral deposits still undeveloped.

The mineral industries of the nation are in a state of flux. Invention, scientific discoveries, and research hurl new problems at them more rapidly than ever before. There also is a trend toward refinancing and consolidating or merging of companies, and the solution of many of the larger economic problems lies in this direction.

Pennsylvania owes its greatness to the pioneers who developed her mineral resources. Today, in order to meet the exacting needs of the mechanic arts there is an urgent demand for mineral technicians. They must have the same zeal and intellectual curiosity of the early adventurers, but must also be endowed with the true scientific spirit. Pennsylvania's mineral industries are turning to their state college for men of undergraduate and graduate training, as well as fundamental research on their technical problems.

W. L. Affelder
Vice President, Hillman Coal and Coke Company (Class of '99)

John C. Cosgrove
Chairman of the Board of Directors, Cosgrove-Meehan Coal Corporation (Class of '07)

George H. Deike
President, Mine Safety Appliances Company (Class of '03)

Jesse B. Warriner
President, Lehigh Navigation Coal Company (Class of '05)

School of Industries

By Edward Steidle

DEAN, SCHOOL OF MINERAL INDUSTRIES, THE PENNSYLVANIA STATE COLLEGE, STATE COLLEGE, PA.

Professor Wm. R. Chedsey
Head of the Department of Mining

Edward Steidle
Dean, School of Mineral Industries

New Building

It is not surprising that Pennsylvania's public institution of higher learning should be concerned with the interests of this great industry and with the people who are engaged in it.

On August 15, 1929, the college broke ground for a new mineral industries building. It will be the largest academic building on the campus and one of the finest buildings devoted to mineral industry education in America. The building will be of rose brick with white stone trim in the Georgian style. Two hundred feet in length, the building will have wings at each end 135 ft. deep. The four floors total nearly 65,000 sq. ft. The plant, fully equipped, will represent an investment of about $750,000.

Broad stone steps and pillars will lead to the main entrance of the building; the office of the dean of the school and a mineral museum will be at the right and left of the lobby. Two basement floor entrances are at the rear and at the ends of the main structure of the building, leading to stairways. An elevator with entrances on each floor, is located in the center of the building. Offices of the heads of all departments in the school will be on the first floor. On this floor also will be laboratories for geology, mineralogy and geography. The hallways are planned for displaying exhibits, both permanent and temporary, of educational and historical interest.

The second floor will house the work in iron and steel metallurgy, general metallography, fuels, and oil and gas analysis; also ceramic laboratories for work in brick, refractories, glass, white ware, enamels, porcelain, terra cotta, tile, cement, and plaster. Dumbwaiters connect the laboratories at the ends of the wings with the basement.

On the third floor will be a general museum, mine safety and gas testing laboratories, drafting room, reference library and a large service class room which can be used as a meeting room for technical societies. On this floor also will be the laboratories and offices of the experiment station and Department of Extension Service.

The basement floor will house the kiln room, metallurgical furnace room, technical analysis laboratories, and laboratories devoted to mining machinery, oil and gas production, ore dressing and coal preparation. A ventilation tunnel will be located under the mining machinery laboratory and suitable space is provided for a Pennsylvania core depository.

Advisory Boards

Of first importance, and certainly the most logical function of the State School of Mineral Industries, is the proper training of the undergraduate by class-

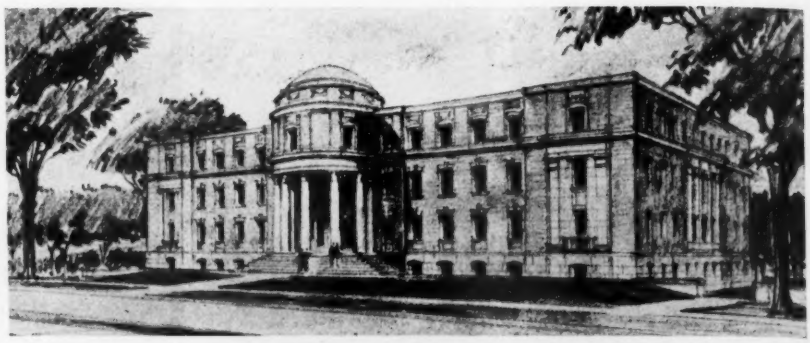
room and laboratory instruction. Research constitutes a second function, while the third is that of extension service, which is becoming more popular. The efficient carrying out of these functions demands a well-knit connection with in-industry. Prospective employers of graduates may well be given a voice in the proper training of men. Industrial research projects must be offered to the college for solution and an effective extension service demands friends and advisors in industrial fields.

In line with these functions of the school, eight advisory boards have been created, and several more are to be formed in the near future. These boards, as the name implies, are formed to act in an advisory capacity for the various departments. They are self-controlled, second-party units. Most of the consultation is carried on by correspondence and personal interview, but one regular business meeting is held each year at the college or at another convenient, centralized point. Eventually every phase of the mineral industries will be represented by a board of at least 10 men. Those chosen are prominent executives and scientists, whose advice and counsel are of greatest value. There are many more outstanding men whose membership is very much desired, but the need for a wide geographic distribution of members largely governed the selection.

The president of the college, Dr. Ralph D. Hetzel, is an ex-officio member of each board. His connection crystallizes a valuable administration contact with industry. Another ex-officio member of each board is a public official. Walter H. Glasgow, secretary of mines, is an ex-officio member of all the coal mining advisory boards, while George H. Ashley, state geologist, acts in that capacity on the petroleum and the natural gas advisory boards. Peter Glick, secretary of labor and industry, acts as an ex-officio member for the metallurgical, non-metallic mining, and ceramics advisory boards. Photographs of the chairmen of the three coal mining boards are given herewith. The dean of the school is acting vice chairman of each board, and the head of the particular department involved acts as secretary.

A series of lecture courses is being worked out, utilizing the background of knowledge and experience of the advisory board members or their colleagues which will help to keep the school in the first rank.

In the promotion of a research program, the industries and state departments at Harrisburg will be invited to send representatives to use the school's laboratories and equipment and receive the professional aid of the faculty. The students, having been educated under suggestions and advice from the advisory boards, are given preferential treatment in being placed after graduation.



New Mineral Industries Building, to be completed July, 1930

Tunnel under Building for Mine Ventilation Research

School of Mineral Industries

On October 26, 1929, the board of trustees officially renamed the then School of Mines and Metallurgy, the "School of Mineral Industries." The new name is significant and more nearly embraces the activities of the school. The school originated in 1891 as a department of mining, later it became the School of Mines and Metallurgy, then the School of Mines, and still later was renamed the School of Mines and Metallurgy. The school now embraces every phase of mineral industry education, including geology, mineralogy, geography, ceramics, oil and gas production, and fuel technology. The present name, School of Mineral Industries, is considered more appropriate for a state institution of a commonwealth endowed with varying mineral resources and industries, and the school is just as logical as a school of agriculture. Pennsylvania now has the only School of Mineral Industries in America, uniting every related field of study under one roof and one administrative head. The organization is ideal from a pedagogical viewpoint and instructional cost per student is at a minimum for this class of work.

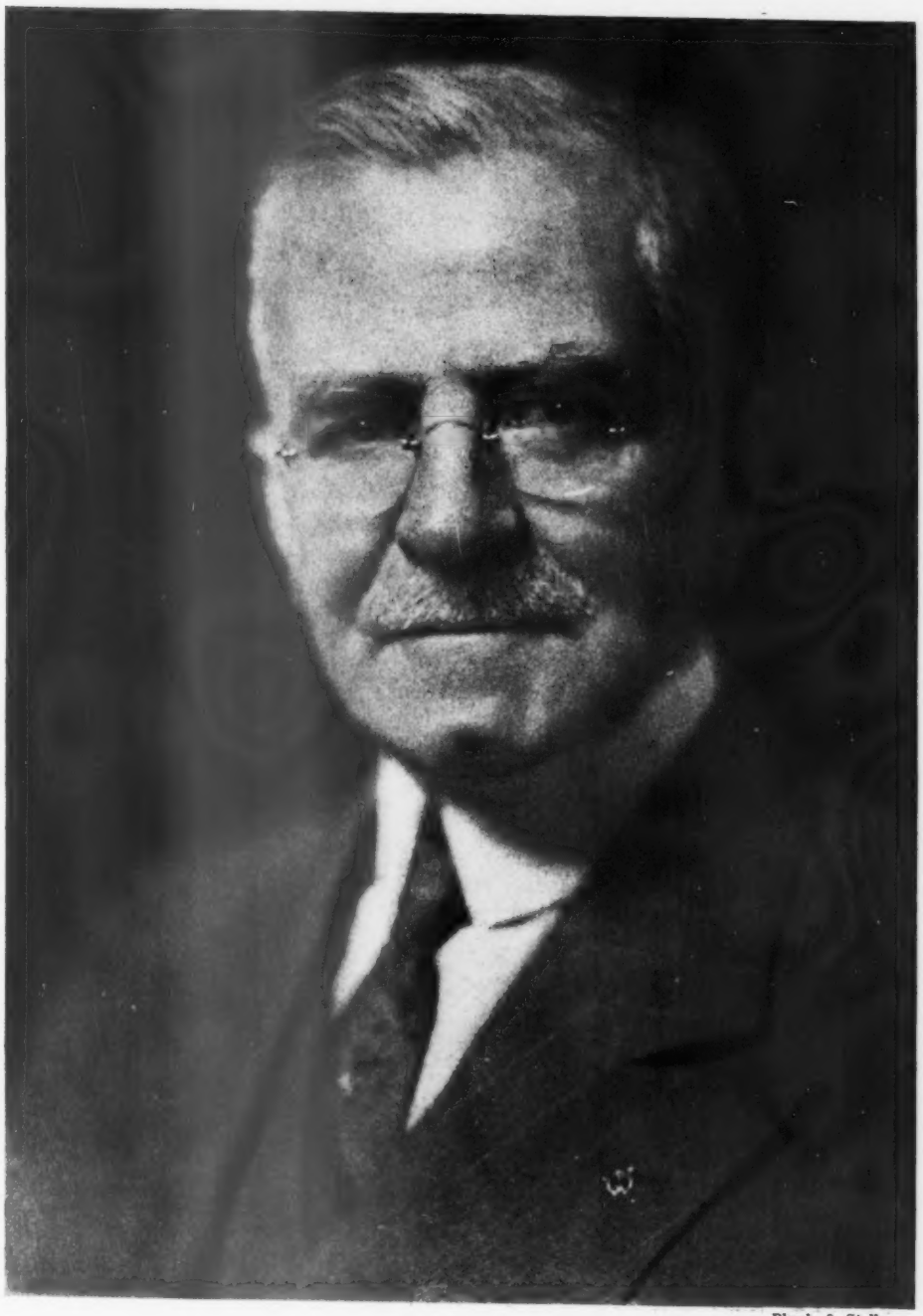
The school is divided into six divisions, i. e., department of geology, including oil and gas production; department of mining; department of metallurgy, including fuels; department of ceramics; department of extension service; and the mineral industries experiment station. Each division stands on its own responsibility. The school rightly constitutes a center of mineral industry education, extension and research in Pennsylvania.

Department of Mining

The education of a mining engineer is a complicated matter. The responsibilities placed upon that profession are great. The ability of such an engineer to adjust himself to ever changing conditions, to explore and create new ideas, is something that requires more than classroom contact. It demands several years of inspiring help and guidance on the part of the faculty. The members of the faculty of the department of mining are personally interested in the welfare of every student and this contact is seldom broken by graduation.

The department of mining is under the direction of William R. Chedsey, an engineer trained in the Colorado School of Mines. His experience includes all phases of mining operations and brings to the school the viewpoint and knowledge of the western mining sections, from Costa Rica to Alaska, as well as eastern conditions. Sion B. Smith, a graduate of Allegheny College and an attorney of Pittsburgh, is a professorial lecturer in mining law. James W. Stewart was (*Continued on page* 484)

THE AMERICAN MINING CONGRESS



Blank & Stoller

JAMES F. CALLBREATH
Secretary of The American Mining Congress

CONVENTION PRACTICAL COAL OPERATING MEN

C. L. HERBSTER
Chairman of the Manufacturers Division,
The American Mining Congress

L. W. SHUGG
Director of Exhibits, National Exposition of Coal Mining Equipment

P. C. THOMAS
Chairman, Program Committee, Seventh Annual Convention, Practical Coal Operating Men

The COAL INDUSTRY Meets

Paul Weir

W. L. Affelder

Newell G. Alford

Members of Advisory Committee

OUTSTANDING developments in the coal mining industry in 1929-30; Mechanized Mining; Coal Cleaning and Preparation; Personnel Training; Cost Accounting; Accident Prevention and Mine Safety; Transportation and Maintenance; and the Problems of the Strip Miner—these are the subjects to be presented by a group of the coal industry's able executives during the great convention and exposition to be held under the auspices of The American Mining Congress, Music Hall, Cincinnati, Ohio, May 5-9, inclusive.

This splendid presentation has been arranged for under the personal direction of Mr. P. C. Thomas, manager of mines, The Koppers Coal Company, and a distinguished group of operating men, who have cooperated with him on the Program Committee.

This is the seventh consecutive year that the Manufacturers Division of The American Mining Congress has staged similar conventions and expositions at Cincinnati. Each year has seen a steadily growing interest, a greater attendance, a larger exposition, and a wider appreciation of just what such a meeting can do for the coal industry.

The 1930 Convention and Exposition will live up to the reputation of its predecessors. The Exposition is by far the largest yet arranged for; the program of tremendous interest at this time when the industry is so rapidly turning from hand to mechanized methods of mining; the attendance will be greater than at any previous year, if present indications materialize. At this writing, April 20, the hotels are pushed to capacity, and the demand for the return-fare-identification certificates, which entitle a delegate to attend the meeting at the reduced rate, is unprecedented. The program is entirely complete, the exposition almost sold out, and everything in excellent shape to render a real service to the industry.

The program will consist of eight major sessions, beginning Monday afternoon, May 5. Delegates will begin registration at 9 o'clock that morning, and the exposition will officially open at that hour. The time between the opening of the exposition and the convention will give the delegates an opportunity to inspect exhibits, visit with their friends, and get settled at their hotel.

The first session will be a "review"; it will present, and bring up-to-date information on the various phases of the industry, and will present some extremely interesting information on the advancement of mechanized mining. A meeting of the National Committee on Mechanized Mining, which is a part of the National organization—The American Mining Congress—will hold a meeting immediately following the presentation of six papers.

Tuesday, May 6, will be devoted to a discussion of the problems of Mechanized Mining, and Transportation and Maintenance. Among the interesting things these sessions will present, will be Securing Greater Power at the Loading Machine; How to Keep Costs and Statistics in Connection with a (*Continued on page* 450)

Ezra Van Horn

Dr. L. E. Young

George B. Harrington

Members of Advisory Committee

PROG

THE AMERICAN MINING CONGRESS

PRACTICAL COAL

MUSIC HALL, CINCINNATI,

Monday, May 5, 9 a. m.

Registration of Delegates

Inspection of Exhibits

Monday, May 5, 2 p. m.

OUTSTANDING DEVELOPMENTS IN COAL IN 1929-30

CHAIRMAN: DR. L. E. YOUNG
Vice President, Pittsburgh Coal Company

"Mechanized Mining"
By G. B. SOUTHWARD, *Mechanization Engineer, The American Mining Congress.*

"Statistics on Mechanized Mining"
By F. G. TRYON, *Head, Statistics Section, Coal Division, U. S. Bureau of Mines.*

"Developments in Anthracite"
By ELI T. CONNER, *Consulting Engineer, Scranton, Pa.*

"Developments in Fuel Utilization"
By HOWARD N. EAVENSON, *of Eavenson, Alford & Hicks, Pittsburgh.*

"Developments in Strip Mining in the United States"
By K. A. SPENCER, *Charge of Engineering, Pittsburg & Midway Coal Mining Company.*

"Developments in Mining Machinery in the United States and Europe"
By W. H. RASTALL, *Chief, Industrial Machinery Division, U. S. Department of Commerce.*

Tuesday, May 6, 9 a. m.

MECHANIZED MINING

CHAIRMAN: R. L. IRELAND, JR., *Manager, Bituminous Mines, M. A. Hanna Company.*

"Coal Cutting with Track Machines and General Face Preparation"
By GEO. F. CAMPBELL, *General Manager, Old Ben Coal Corporation.*

Discussion

"Gathering Methods Developed for Mechanized Loading"
By R. J. OLDHAM, *Superintendent, Centralia Coal Company.*

Discussion
CHAS. GOTTSCHALK, *Big Vein Coal Company.*
G. C. MCFADDEN, *Peabody Coal Company.*

"Power in Mechanical Mining"
By CARL LEE, *Electrical Engineer, Peabody Coal Company.*

Discussion
F. L. STONE, *General Electric Company.*

"Keeping Costs and Statistics In Connection With Mechanized Loading"
By W. L. AFFELDER, *Vice President, Hillman Coal & Coke Company.*

Discussion

Tuesday, May 6, 2 p. m.

TRANSPORTATION AND MAINTENANCE

CHAIRMAN: F. R. LYON, *Vice President, The Consolidation Coal Company.*

"Large Locomotives in Long Haulage"
By G. G. KANABLE, *Chief Electrical Engineer, Rochester & Pittsburgh Coal Company.*

Discussion
CHAS. M. MEANS, *Consulting Engineer, Pittsburgh, Pa.*

"Increasing Capacity of Mine Cars"
By F. S. FOLLANSBEE, *Chief Engineer, The Koppers Coal Company, Inc.*

Discussion

"Anthracite Stripping and Transportation"
By W. S. RAUSCH, *Mining Engineer, Lehigh Navigation Coal Company.*

Discussion

"A 100 Percent Mechanical Loading Operation"
First showing of the moving picture film of the Wildwood operation, Butler Consolidated Coal Company
Presented by W. P. VANCE, *Chief Engineer and General Superintendent, Butler Consolidated Coal Company.*

Wednesday, May 7, 9. a m.

PERSONNEL TRAINING

CHAIRMAN: MILTON H. FIES, *Vice President, in Charge of Operations, DeBardeleben Coal Corporation.*

"Vocational Training Among Coal Mine Employes"
By DR. J. J. RUTLEDGE, *Chief Mine Engineer, Maryland Bureau of Mines.*

Discussion
W. D. BRENNAN, *Utah Fuel Company.*
CHAS. ENZIAN, *Consolidation Coal Company.*
R. M. LAMBIE, *Department of Mines, of West Virginia.*
H. E. NOLD, *Ohio State University.*
C. E. LAWALL, *School of Mines, W. Va. University.*

"Training Men at Face"
By F. E. BEDALE, *Engineer of Safety, Consolidation Coal Company.*

Discussion
J. W. BISCHOFF, *West Virginia Coal & Coke Company.*
J. A. LONG, *Woodward Iron Company.*
S. W. BLAKSLEE, *Pennsylvania Coal & Coke Corporation.*
E. J. CHRISTY, *Wheeling Township Coal Mining Company.*

"Developing Bosses and Coaching Men"
By GOMER REESE, *General Superintendent, Kemmerer Coal Company.*

Discussion
H. S. GILBERTSON, *Lehigh Navigation Coal Company.*

Awarding of Jos. A. Holmes' Safety Certificate to Sheridan-Wyoming Coal Company—Presentation by J. J. Forbes, U. S. Bureau of Mines

Wednesday, May 7, 2 p. m.

MECHANIZED MINING (Thin Seams)

CHAIRMAN: D. D. DODGE, *General Superintendent, W. J. Rainey, Inc.*

"Entry Development with Conveyors"
By JOHN H. RICHARDS, *Chief Mining Engineer, Wheeling & Lake Erie Coal Mining Company.*

Discussion

RAM

SEVENTH ANNUAL CONVENTION
OPERATING OFFICIALS

OHIO, MAY 5-6-7-8-9, 1930

"Conveyors in Room and Pillar Operations"
By GEO. J. KREBS, *Supt., Reading Iron Co.*
Discussion
M. D. COOPER, *Hillman Coal & Coke Company.*
L. H. SCHNEER, *Consolidation Coal Company.*

"Mechanized Mining in Alabama"
By D. A. THOMAS, *President, Montevallo Coal Mining Company.*

"Long Face and Long Wall Mining Methods"
By EARL H. MCALPINE, *Mining Engineer, Haileyville, Okla.*
Discussion
C. A. GRIFFITH, *Pruden Coal Company.*

Thursday, May 8, 9 a. m.

MECHANIZED MINING (In High Coal)

CHAIRMAN: W. J. JENKINS, *Vice President and General Manager, Consolidated Coal Company of St. Louis.*

"Development and Operation with Mechanical Loaders in Illinois"
By T. J. THOMAS, *President, Valier Coal Company.*
Discussion
OTTO HERRES, *Utah Fuel Company.*

"Development and Operation with Mechanical Loaders in West Virginia"
By H. B. HUSBAND, *General Manager, Fuel Mine Operations, Chesapeake & Ohio Railway Company.*
Discussion

"Operation with Conveyors"
By F. W. WHITESIDE, *Chief Engineer, Victor-American Fuel Company.*
Discussion
G. A. BROWN, *Union Pacific Coal Company.*

"Mechanical Loading for Rock Work Through Caved and Filled Areas"
By SHELDON JONES, *Efficiency Engineer, Lehigh Valley Coal Company.*

Thursday, May 8, 2 p. m.

CLEANING COAL

CHAIRMAN: R. E. TAGGART, *Vice President, Stonega Coke & Coal Company.*

"Cleaning Coal at the White Oak Coal Co."
By W. E. TISSUE, *Assistant Sales Manager, White Oak Coal Co.*
Discussion

"Cleaning Coal at Central Indiana Coal Co."
By WM. H. STEWART, *General Superintendent, Central Indiana Coal Company.*
Discussion

"Cleaning Coal at Consolidation Coal Co."
By ROBERT RIGHTMIRE, *Engineer of Tests, Consolidation Coal Company.*

"Cleaning Anthracite Coal"
By PAUL STERLING, *Mechanical Engineer, Lehigh Valley Coal Company.*

"Cleaning West Virginia Coal"
By R. H. KELLEY, *Greenbrier Coal & Coke Company.*
Discussion

Friday, May 9, 9 a. m.

ACCIDENT PREVENTION

CHAIRMAN: A. J. MUSSER, *Vice President, Clearfield Bituminous Coal Corporation.*

"Methods Employed in Developing, Maintaining and Enforcing Safety Codes"
By A. S. WILSON, *General Superintendent, Boone County Coal Corporation.*
Discussion
ARTHUR POLLOCK, *Ford Collieries Company.*
WALTER H. GLASGOW, *Secretary of Mines of Pennsylvania.*
R. L. HAIR, *Colorado Fuel & Iron Company.*

"Relation of Mechanical Mining to Safety"
By A. W. DICKINSON, *Mining Engineer, The American Mining Congress.*
Discussion
J. D. ZOOK, S. W. BLAKSLEE, E. A. SIEMON, EDW. BOTTOMLEY, F. S. PFAHLER, J. W. STEDELIN, THOS. G. FEAR, E. J. CHRISTY, FRANK HILLMAN, C. A. MCDOWELL, EDGAR L. TAIT, OTTO HERRES.

"Physical Examinations in Relation to Accident Prevention"
By T. E. LIGHTFOOT, *Engineer in Charge of Accident Prevention and Compensation, The Koppers Coal Company, Inc.*
Discussion
WM. ROY, *Wheeling & Lake Erie Coal Mining Company.*
D. D. DODGE, *W. J. Rainey, Inc.*

"The Safety Award Winners (How They Do It)"
By (Bituminous) Hull No. 33 Mine, De Bardeleben Coal Corporation.
(Anthracite) Highland No. 6 Mine, Jeddo-Highland Coal Company.

"Rock Dust Practice"
By D. L. BOYLE, *Superintendent of Mines, Penelec Coal Corporation.*

Friday, May 9, 2 p. m.

MECHANIZED MINING (100 Percent Mechanized)

CHAIRMAN: IRA CLEMENS, *President, The Commercial Fuel Company.*

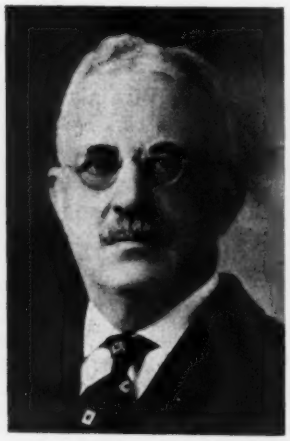
"A 100 Percent Pit Car Loader Operation"
By F. S. PFAHLER, *Vice President and General Manager, Superior Coal Company.*
Discussion
J. S. MCKEEVER, *Kanawha & Hocking Coal Company.*
H. G. CONRAD, *Knox Consolidated Coal Company.*

"A 100 Percent Scraper Operation"
By C. R. STAHL, *Division Superintendent, C. C. B. Smokeless Coal Company.*
Discussion

"A 100 Percent Mechanical Loading Operation"
Moving picture film of the Wildwood operation, Butler Consolidated Coal Company
Presented by W. P. VANCE, *Chief Engineer and General Superintendent, Butler Consolidated Coal Company.*

A summary of the special entertainment features of the convention will be found on page 461

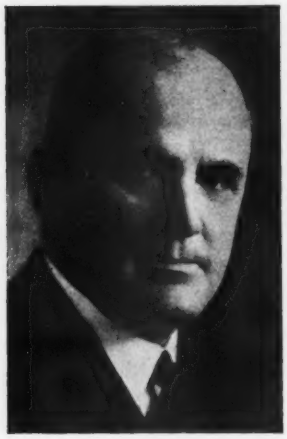
D. A. Thomas



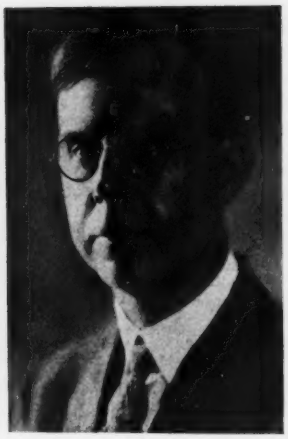
Franklin Bache

V. C. Robbins

R. L. Hair



Ira Clemens



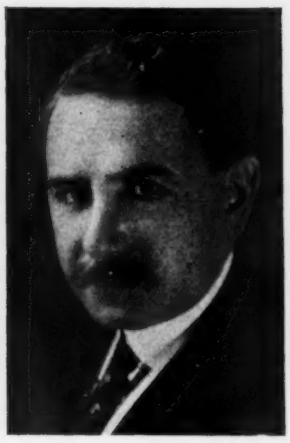
L. B. Abbott

R. P. Maloney

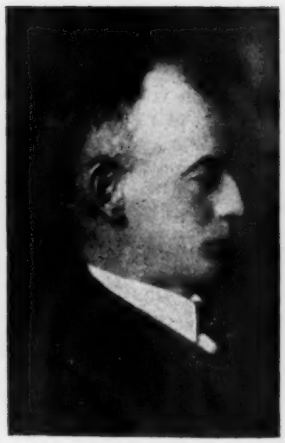
Members of Committee Convention of Operating

Thos. W. Dawson

M. D. Cooper



G. J. Krebs



Geo. A. Schultz

Mechanized Mining System; Gathering Methods for Mechanical Loaders, and the Most Recent Developments in Cutting with Track Machines, and General Face Preparation. The adoption of mechanized mining has led to the demand for larger mine cars, and this subject, together with the use of large locomotives, and the problems of the strip operator, will complete the discussions for the day, with the exception of the first showing of the moving picture of the first mechanized mine—the Wildwood Operation of Butler Consolidated Coal Company. This film will be one of the real high lights of the convention, and will be presented at least twice, and possibly three times, in order that all delegates may have the opportunity to see it.

Wednesday, May 7, will be given over to a discussion of the problems of Personnel Training, and Mechanized Mining in Thin Seams.

There is no subject in the coal industry of greater importance than that of the proper training of the men, either as to the use of the machine, or in general safety. The program arranged for the session on Personnel Training is a splen-

B. W. Snodgrass

F. S. Pfahler

C. J. Fletcher

K. A. Spencer

the Program for the Annual Practical Coal Officials

Horace Moses

R. E. Hobart

S. W. Blackslee

Lee Long

P. C. Graney

Thomas G. Fear

Geo. B. Pryde

did one, and will be participated in by some 20 operators, who will tell what they are doing.

Cleaning Coal and Mechanized Mining in High Coal will occupy the limelight on Thursday, May 8, and the day will be concluded by the holding of the informal dinner, on Thursday evening.

Two of the most interesting sessions of the convention will be held on Friday, the closing day of the convention. These are the 100 Percent Mechanized Mine and Accident Prevention. An unusual program is arranged for the Accident Prevention session, and it is anticipated that the Joseph A. Holmes Memorial Safety Award will be made at this session. In addition it is hoper that the winners of the National Safety Competition and of the Sentinels of Safety trophy will appear at the meeting. Safety with Mechanical Mining will be one of the topics discussed, with approximately 20 operators representing as many different properties participating. A 100 percent pit car loader operation; a 100 percent scraper operation, and the final showing of the 100 percent mechanized mine—

the Wildwood property of Butler Consolidated Coal Company, will conclude the convention.

Entertainment Features

Exceptionally fine entertainment will be arranged for the delegates which will be participated in by the Cincinnati Chamber of Commerce, The Cincinnati Coal Exchange, and members of the local group of operators. On Monday night, there will be a reception at the Gibson Hotel with members of the local committee to welcome the delegates. This will be of short duration, and will be followed by the first showing of the Wildwood film, followed by dancing and music. Tuesday evening will be left free for delegates to entertain themselves as they wish.

A complimentary dinner will be tendered Mr. P. C. Thomas, chairman of the Program Committee, in appreciation of the splendid work he has done as chairman. Luncheons for various groups, including members of the Southern Division, Board of Governors, The American Mining Congress; members of the various standardization committees of The American Mining Congress; dinners for the Engineering Education Committee, and the Manufacturers Division of the parent organization.

Special entertainment is being arranged for Wednesday evening, and the informal dinner on Thursday night, May 8, will be up to last year's record-breaking event. There will be no speeches. There will be plenty of entertainment and fun, and an excellent dinner.

These conventions and expositions offer an unparalleled opportunity to the coal operator. Not alone does it enable the executives to become familiar with what the industry is doing; it enables his assistants to learn first hand the vast amount of information disseminated at the meeting. Companies are sending more and more of their men each year, and as the circle widens, so the developments in efficient production widens. Quoting from that able authority on the industry, Mr. Newell G. Alford, of Eavenson, Alford and Hicks, and associate editor of this magazine "Legion are the younger men in the coal mining industry today with the ambition and energy to succeed in a large way. Not a few of them are considering the advisability of turning to other work than mining with more apparent promise of reward. Just why should the coal industry allow these younger men to regret their choice of coal mining as a means of livelihood? Is longer range vision not distorted by absorption from present inside competition and the growing invasion of substitute fuels? Cincinnati offers an excellent opportunity for these young men."

It is to be hoped and we urge the industry to send its promising young men to this Cincinnati convention. If it will do so it will find the rewards far greater than the expense, particularly if the management will find out and utilize the knowledge they gain at this meeting.

The arrangements for this year's meeting have been directly under the auspices of The American Mining Congress, sole sponsor for the convention and exposition. They have been guided by the able management of Mr. Thomas and his excellent committee, and the support and cooperation of the members of the Manufacturers Division of The American Mining Congress, headed by Mr. C. L. Herbster, of the Hockensmith Wheel and Mine Car Company. E. R. Coombes, of the staff of The American Mining Congress, and editor of The Mining Congress Journal, has acted as secretary of the Program Committee. The management this year has also had the active cooperation of the National Committee on Mechanized Mining, of which Mr. G. B. Southward is mechanization engineer. The General Electric Company has consented to again permit their Mr. L. W. Shugg to act as director of exhibits. Altogether the arrangements for the meeting, and the cooperating forces, insure a convention and exposition of outstanding merit.

Members of the Program Committee are:

Program Committee: Chairman, P. C. Thomas, general manager of mines, The Koppers Company. Secretary, E. R. Coombes, assistant to secretary, The American Mining Congress.

Advisory Committee: Paul Weir, Dr. L. E. Young, Geo. B. Harrington, W. L. Affelder, Ezra Van Horn, Newell G. Alford.

Alabama—D. A. Thomas.

Arkansas and Oklahoma—Franklin Bache, V. C. Robbins.

Colorado—R. L. Hair, B. W. Snodgrass.

Illinois—F. S. Pfahler, G. C. McFadden.

Indiana—C. J. Fletcher.

Kansas, Missouri and Iowa—K. A. Spencer, Ira Clemens.

Kentucky—W. G. Duncan, Jr., L. B. Abbott.

Maryland—R. P. Maloney.

New Mexico—Horace Moses.

Ohio—R. V. Clay.

Pennsylvania (Anthracite)—R. E. Hobart.

Pennsylvania (Bituminous)—S. W. Blakslee, Geo. J. Krebs, Thos. Dawson, M. D. Cooper.

Utah—Geo. A. Schultz.

Virginia—J. D. Rogers, Lee Long.

West Virginia—P. C. Graney, Thos. G. Fear.

Wyoming—Geo. B. Pryde.

The Lobby at the 1929 Convention

THE NATIONAL EXPOSITION of Coal Mine Equipment

AN OUTSTANDING feature of the American Mining Congress' Convention of Coal Operating Officials each year is the National Exposition of Coal Mining Equipment. This exposition, held in conjunction with the convention is set in the wings of the auditorium adjacent to the hall in which the meetings convene and presents a complete display of the various types of machinery, equipment and appliances used by the industry. Because of its value in giving convention delegates a convenient opportunity of viewing under one roof exhibits which cover practically the entire field of coal mine mechanization, and which include the latest and most improved devices, it is looked forward to annually as an important and useful adjunct by coal operators.

But at no time within the previous six years during which the conventions have been held has the national exposition played so important a part as it will at the coming convention to be held in Cincinnati, May 5 to 9. With the industry's interest in mechanization at a new peak, demand for floor space has exceeded all past records, manufacturers have prepared more extensive displays and the exposition will be the largest and most complete of its kind ever held.

Great have been the improvements in mining machinery and equipment made during the past year, and special attention will be devoted by manufacturers in throwing the spotlight on these displays and in bringing before delegates and visitors many new machines and devices which will be demonstrated for the first time to operators.

More than 125 exhibitors have been alloted approximately 30,000 sq. ft. of floor-space for their displays, which are being planned with great care and attention to emphasize the high points in each manufacturer's products and a large corps of experts, technicians, factory representatives and executives will be on hand to take charge of each separate exhibit.

Leading authorities on mechanization will be present to help solve the operator's problems and to answer his questions, and trained engineers will demonstrate machinery in operation and will show the proper methods of using equipment appliances for greatest efficiency.

NEW THINGS to see at Cincinnati

Stainless steel for mine pumps.
New reversible bit and bit holders
New electric hammer.
Separator magnet remoping tramp iron from coal.
Separation of wood, sulphur balls and tramp iron from coal.
New Cardox cartridge.
New Sullivan coal cutter.
New Goodman low vein shortwall.
All-steel electric welded mine car.
Jeffrey 44-C loading machine.
New type pit car loaders.
Improved type 7 B. U. Joy Loader.
New type dump car.
Edison Model H lamp.
Whaley automat loader.
275 kilowatt mercury arc rectifier.
Internally lubricated wire rope.
Health-giving sunshine lamp for underground workers.
Double compartment rewashing hydro-separator.
Simon-Carves wash box.
Concenco flat picker.

Including a vast variety of equipment, the displays will comprise many full-size working models and elaborate animated exhibits on a miniature scale, as well as exhibits of machine parts, tools, and many forms of safety and life-saving apparatus.

There will be booths equipped with motion-picture projectors throwing continuous mechanization film subjects, other displays will be illustrated with stereoptican views, photographs, diagrams, and elaborate working charts, and all will be amply supplied with descriptive and explanatory literature.

An entire miniature mine railway system with automatic throw-switches and signalling devices will be shown in operation in one booth. In another, mechanized mine shafts will be exhibited in cross-section. A complete miniature coal mine will be shown equipped with automatic bottom-dumping cars. There will be on display a motor-operated tipple model, with bumper car stops, an automatic mine tipple weight indicator and recording device, as well as full sized mine cars, electric locomotives, loading and cutting machines, "duck-bills," and many types of coal preparation machinery including washing and dry cleaning devices, and other exhibits include pumps and ventillating blowers in operation, haulage equipment and supplies, electrical equipment, power transmission apparatus, explosives and blasting equipment, and the newest and latest improvements in safety devices and appliances.

Practically every manufacturer of major importance to coal mining will be represented at the exposition. The United States Bureau of Mines which is preparing a special Government exhibit, and the various displays are classified as follows: Bearings, Cutting and Shearing Machines and Equipment, Drilling Machines, Electrical Equipment, Explosive and Blasting Equipment, Haulage Equipment and Supplies, Hoists and Dumps, Lamps, Loaders, Conveyors and Scrapers, Lubricants and Lubricators, Mechanical Power Transmission Apparatus, Miscellaneous, Preparation, Publishers, Pumps and Piping, Safety Equipment, Testing and Weighing Devices, U. S. Government, Ventillation Equipment, Wire Rope, Shovels and Wood Treating.

The exposition is sponsored by the Manufacturers Division of the American Mining Congress of which C. L. Herbster is chairman of the Board of Governors, with F. J. Maple, Charles C. Whaley and Ralph C. Becker, as vice-chairmen, and an able committee in charge of making all plans and preparations.

The management of the exposition will again be in charge of L. W. Shugg who, through the courtesy of his company, the General Electric Company of Schenectady, N. Y., will serve as director of Exhibits. Mr. Shugg has been director of exhibits for the last three exhibitions, and his wide experience not only with his company but as director of exhibits for the National Electric Light Show and for many other leading industrial associations, insures skillful handling and able direction.

National Exposition

F. O. Burkholder

The Ahlberg Bearing Company will show a complete line of "CJB" ball bearings, Alberg Ground Bearings, and Transmission Bearings, such as are generally used in coal mine equipment. The exhibit will be in charge of F. O. Burkholder.

The exhibit of The Louis Allison Company will show their type "E" explosion proof, ventilated, alternating current motor. This is a comparatively new development in the electrical industry and has been favorably reported on by the United States Bureau of Mines. Two motors will be shown, one being assembled complete and the other taken apart to show details of construction. Exhibit will be in charge of R. J. Owen, sales engineer.

The exhibit of American Cable Company will consist of display boards showing complete line of cable and wire used in connection with the mining industry, including hoist, elevator and sling cables and the various accessories, such as hooks, clips, sockets, thimbles, and shackles. In addition they will have a section of bridge cable to display, similar to those the American Cable Company furnished in the erection of the Delaware River Bridge, Detroit River Bridge and Mount Hope Bridge.

Mr. W. H. Slingluff, of the Chicago office, will have charge of the exhibit.

American Car and Foundry Company will show one of their drop bottom mine cars, one car of a type they build regularly, some wheels and equipment which will be of interest to the industry, and as usual, Mr. J. L. McDowell will have charge of the exhibit.

The exhibit of the American Coal Cleaning Corporation will consist of one complete operating unit, including their latest type "R" 72144, American Pneumatic Separator, with anti gravity middlings return chutes, hoppers and feeders. The exhibit will be in operation and will be in charge of Edward O'Toole, Jr.

The American Hard Rubber Company will exhibit soft rubber lined steel pipe, hard rubber lined steel pipe and fittings for same; hard rubber lined crane No. 465 gate valve in various sizes and hard rubber lined flumes, all representative of their work to protect equipment from corrosion by acid mine water. They will also exhibit a section of rubber lined pipe cut in half and small portion of this pipe will be left bare of rubber. By means of a small, hard rubber pump, they will pump a solution which will be the equivalent of acid mine water to show the relative resistance of the lining compared with a small section which will not be rubber lined.

Solid hard rubber pipe and fittings will also be exhibited together with a small rubber lined steel tank which is used in connection with actual corrosion test.

Photographs will amplify the exhibit which will be in charge of D. Wilkins, H. S. Brady and M. Husselrath.

A. J. Gurney

A. J. Gurney will be in charge of the exhibit of **The American Mine Door Company.** They will exhibit their high pressure permissible rock-duster together with their electric switch thrower. Signals are given by lights or bells or both—switches are automatically thrown mechanically or electrically by the motorman on the train, without reducing speed.

The American Steel & Wire Company will exhibit their regular line of wire rope, electric wire and cables including mining machine cables and rail bonds. The following representatives of the company will be present, Messrs. H. H. Febrey, Herman Barthel, R. A. Coates, C. J. Boon, A. C. Jones, R. E. Francisco.

B. G. Durham

The exhibit of the Albert & J. M. Anderson Mfg. Co., will consist of electrical material for use in and around mining properties, a complete line of plugs and receptacles in all capacities from 20 amperes to 500 amperes for the charging of storage batteries on battery operated locomotives, a complete line of plugs and receptacles for making electrical connections to coal cutting machines, electrically operated shovels and conveyors. These will be in all capacities for both alternating and direct current. And in addition, a complete line of trolley line material including mine hangers and insulators, trolley ears and clamps, section insulators, frogs and crossings and knife switches for sectionalizing the trolley line.

The exhibit will also include testing clamps and air vane relays, in addition to our automatic time switch used for the control automatically of surface lights around the mines.

B. G. Durham will be in charge of the exhibit.

W. F. Webster

Mr. F. W. Webster will be in charge of the **Atlas Powder Company** exhibit, which will consist of a display of electric firing devices and blasting machines.

The Baldwin Locomotive Works will show their equipment in conjunction with Westinghouse Electric & Mfg. Company; and will probably display their permissible mine locomotive.

The Bethlehem Steel Company exhibit will consist of a moving exhibit of mine cars and an extensive exhibit of trackwork and mine ties including switch stands, Bethlehem standard mine ties, Bethlehem Nos. 9 and 17 Keystone mine ties and a number of specialties such as car sprags, coupling pins and links, rail clamps, frogs, structural shapes and drill steels. The exhibit will be supplemented by enlarged educational photographs.

Mr. W. B. Pritchard will be in charge of the exhibit.

The Bonney-Floyd Company will present their high capacity, high live load-ratio, roller bearing, spring draw bar, spring bumper alloy steel wheels, mine car; Bonney-Floyd cast steel mine car bumpers; their cast steel mine car wheels; and their cast alloy steel heat treated mine car coupling.

The exhibit will be in charge of James L. Cawthon, Jr.

K. A. Reid

Boyts, Porter & Company will exhibit their Yough 6000 Series, 5½ by 8 piston mine gathering pump, equipped with 10 hp. variable speed motor, mounted on tank, and taking its water through three branch suction lines automatically controlled by Yough automatic suction control valves. New Yough centrifugal pump operated by 15 hp. motor. The design of this pump is new and distinctive. Yough 2½-in. rotary mine gathering pump—no motor. Yough strait-flo check valve. Display of major parts of the three pumps.

The exhibit will be in charge of Kenneth A. Reid.

The Brown-Fayro Company will show a complete line of their "Brownie" equipment including permissible hoist, Model HG, with Westinghouse RH motor and switch. Model HI hoist, featuring an electrically operated brake for operations where remote control is required or where it is desirable to hold the load on a grade for any length of time. Permissible mine car loader, Model LF-8, a readily portable machine having a double chain flight conveyor with self-contained power unit and self-cleaning hopper, high carbon pan bottom and wearing strips and totally enclosed working parts. When operated by two men, 40 to 60 tons of coal can be loaded per day. The Austin-Brownie "Perfect Oiler" mine gathering pump. "The Brownie" car retarder, Model RB, designed for lowering trips of cars past the loading head of conveyors and scraper loaders. Timken bearing mine car truck, illustrating a new type of bearing enclosure, particularly designed for applications requiring caging on the extended wheel hub. A complete line of Multiport check valves, foot valves, strainers, etc., available in cast iron or anti-acid bronze. A number of specialties, including rerailers, derailers, timken bearing sheaves and track rollers, etc.

M. J. Woodhull

The Bucyrus-Erie Company will have a most unusual exhibit. For further details see it in Booth No. 115, North Wing, Music Hall, Cincinnati.

Carnegie Steel Company will exhibit a complete display of Carnegie copper-steel mine ties and Carnegie light rails. Also a set of steel mine timbers, and a number of signs and photographs.

Participating with the parent company will be their subsidiaries, the American Steel and Wire Co. and the Lorain Steel Co.

All of these companies are of the group comprising the United States Steel Corporation.

The exhibit will be in charge of Mr. R. L. Twitchell.

R. M. Patrick

The Central Mine Equipment Company will show their Type A Fairfield mine car loader, also Type B Fairfield mine car loader which is much the same as Type A except that it is built and designed for lower coal seams. Also the coal-master drill bit.

The exhibit will be in charge of R. M. Patrick.

The Central Frog & Switch Company are manufacturers of frogs, bumper or car stop, steel ties, portable turnouts, switch stands, guard rails, etc., and will present an interesting display of this equipment. The exhibit will probably be in charge of E. R. Heitzman.

The main feature of the exhibit of **The Century Wood Preserving Co.** will be two separate groups of mine sets and mine ties, shown in track form. The one set will comprise 10 old treated ties from a mine of the Century Coal Company. The other set, some untreated oak ties.

Over each set of ties will be placed several mine timber sets, including such as they ordinarily furnish framed and treated, ready for installation in the mine. There will also be some sets showing the effects of decay in untreated timbers and the service obtained from old treated sets.

An automatic projecting machine will show slides illustrating the advantages of preserving mine timber, the methods of preparing the timber, storage yards of mine timber, treating plants for mine timber and details of manufacture of preservatives used for treated mine timber.

Various kinds of timber will be exhibited showing the growth of fungus and how it has decayed these timbers. The principal types of preservatives used to inhibit such action by the fungus will be exhibited.

Photographs, pamphlets and books will complete the exhibit, which will be in charge of J. A. Stockdale.

A. E. Thrun

Chicago Automatic Conveyor will exhibit their Red Devil, Model No. 70, pit car loader; a machine for low vein mines.

Exhibit will be in charge of A. E. Thrun.

The exhibit of the **Chicago Pneumatic Tool Company** will comprise the following: Electric and pneumatic coal drills for all types of coal and softer mine rock drilling; electric and pneumatic maintenance and repair tools of the portable type; pneumatic rock drills.

The exhibit will be in charge of Mr. F. E. Taylor.

E. P. Stenger

The Cincinnati Mine Machinery Company will have on display the following equipment: Cincinnati cutter chains, the new Cincinnati reversible bit for cutter chains, the Ohio electric hammer. They will show sections of Cincinnati cutter chains intended for the various makes of mining machines. Also a small Cincinnati chain (one-fourth the usual size) operating on a miniature shortwall machine. They will also exhibit for the first time the new Cincinnati reversible bit and bit holder. This is the first reversible bit which can be used with any and all of the various standard makes of drop-forged cutter chains. In addition they will exhibit the Ohio electric hammer in actual operation. This likewise is a new tool. It is particularly adapted for mounting trolley hangers direct to the mine roof.

The exhibit is in charge of E. P. Stenger.

P. F. Jasick

Coal Mining will display their magazine, **Coal Mining**, and Mr. P. F. Jasick will be in charge.

Coal Mine Management is a publication exclusively for the coal operating man, and is taking space to present to them the service they have to offer. The exhibit will be in charge of J. A. Burton.

R. A. Walter

Conveyor Sales Company, Inc., exhibit will consist of photographs of equipment as well as descriptive literature, and will be in charge of Mr. R. A. Walter.

The Coal Treating Equipment Co. will exhibit for the first time and will show their dust treating equipment.

R. T. Bliss

The Deister Concentrator Company will have a miniture coal washing plant consisting of a Leahy NO-Blind vibrating screen for sizing table feed and a small size coal washing table in operation, preparing coal. The operation of this equipment is continuous; Consenco flat picker, which equipment is used for separating flats from cubically fractured coal. Also a double vibrator 4 ft. by 9 ft., double surface Leahy NO-Blind vibrating screen. This particular piece will be motor drive and will be hooked up so that it may be run to demonstrate its vibrating action.

The exhibit will be in charge of R. T. Bliss.

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E. E. Kendall

The Deming Company will show the new Deming 3-in. 100 gallon per minute "Oil-Rite" mine gathering pump, mounted on cast iron subbase equipped with wheels and axles, and direct-connected by gearing to a 7½ hp. Allis-Chalmers direct current motor. This unit will be equipped with the new Ohio Brass automatic motor starter; new Deming Fig. 4020—1½-in. ball-bearing centrifugal pump in operation, direct-connected to a 3 hp., 1,750 r.p.m. motor. This equipment will be in operation. Different models of belt-driven centrifugal pumps—special acid-resisting water end for Deming 5 x 5 "Oil-Rite," 50 g.p.m. mine gathering pump. Made of stainless iron.

The exhibit will be in charge of E. E. Kendall.

D. F. Evans

The Duff-Norton Manufacturing Company will show their complete line of lifting jacks, and jacks especially useful in the coal mining industry. This includes lifting jacks ranging in capacities from 1 ton to 100 tons, showing a lifting jack that will meet every possible lifting requirement.

The exhibit will be in charge of David F. Evans.

F. E. Rhine

Duncan Foundry and Machine Works, Inc., will exhibit their latest self-propelling turntable type conveyor; also a wheel type conveyor with a number of improvements over last year's model.

The exhibit will be in charge of F. E. Rhine.

The exhibit of E. I. du Pont de Nemours & Company will consist of displays of photographs, diagrams and descriptive text relating to du Pont Explosives especially adapted to coal mining. Also a demonstration of some of the newest types of blasting accessories. There will be present representatives of their technical section who will be competent to acquaint visitors with the details concerning the selection and use of their explosives and blasting accessories. There will also be a display of Ventube—a tubing for installation to ensure adequate ventilating of mines.

The exhibit will be in charge of E. F. Carley.

C. B. Laird

The Eagle Iron Works exhibit will consist of a working model of their new type OC-6 Olson self-dumping cages with automatic car stop and release. These cages for a number of years have held the world's record for hoisting and dumping capacity. They will

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also show descriptive literature on mine cars, plain and roller bearing car wheels and mechanical grizzly screens.

The exhibit will be in charge of C. B. Laird.

F. J. Foley

Edison Storage Battery Company will present an exhibit board showing parts and make-up of the Edison battery; cutaway cells showing the assembled parts in place; dummy cells; a tray of cells; mine safety lamps and other appliances.

The exhibit will be in charge of F. C. McElmoyl.

A. A. Piper

The Electric Controller & Mfg. Company will exhibit a working model showing the application of a separator magnet removing tramp iron from coal on a conveyor. This will consist of a small replica of a separator magnet, approximately 5 in. in diameter, suspended at an angle over the head pulley of a short belt conveyor on which a stream of small size coal will be fed. The conveyor will be motor driven and as the coal passes over the head pulley, small bolts, nuts and other magnetic particles will be removed by the separator magnet. Automatic compensator starters for squirrel cage induction motors, 110 volt to 550 volt, of the oil-immersed, self-contained type; 2,300 volt reduced voltage automatic compensator type and across-the-line type oil-immersed, high voltage starting equipment for squirrel cage and synchronous motors. Across-the-line type starters for small AC squirrel cage motors.

Exhibit will be in charge of A. A. Piper.

The Electric Railway Equipment Company exhibit will consist of display boards and an erected exhibit displaying trolley materials for mines and will include several new devices, as well as their standard line.

Mr. C. A. Cawood will be in charge of the exhibit.

The Electric Railway Improvement Company will show a new type of steel arc weld cross bond known as Type AX. This bond is completely protected against derailed cars as the cable leaves the steel terminal at a point under the base of the rail and lies below the level of the ties from rail to rail. Only ¼-in. of the steel terminal extends outside the rail base so that it is practically impossible to break the terminal off the rail with derailed cars or dragging equipment.

They will also display steel arc weld and copper arc weld rail bonds together with welding rheostats for rail bonding.

The following representatives will be in charge of the exhibit: P. T. Bevers, N. G. Carlson, L. F. Heckert, and E. B. Moore.

The Electric Storage Battery Company exhibit will consist of various types of Exide batteries used in mining locomotive service, and the following representatives will be in attendance: W. VanC. Brandt, L. M. Gay, H. V. Allen, G. H. Thrush, H. R. Johnson, J. F. Fleming, J. M. Vanston.

J. R. Lancaster

Elliott Service Company exhibit will consist of a sample installation of a four-panel bulletin board; samples of individual 17-in. by 22-in. posters which are used for distribution around mines; sample copies of their foremanship material which is used to educate the mine foreman to the importance of man management and his job.

The Elliott Plan Service is a visual plan of constructive material employed for the cutting out of waste and prevention of accidents through a medium of visual appeal.

The exhibit will be in charge of J. C. McCoy.

C. P. Daniels

Enterprise Wheel and Car Corporation will exhibit a low height, large capacity mine car of extra durable type. Also roller bearing trucks and heat-treated mine car hitchings.

The exhibit will be in charge of C. P. Daniels.

J. A. Manly

Fairbanks, Morse and Company will exhibit a coal mine car dial scale fully set up and ready for operation, a portable platform dial scale, a ball-bearing centrifugal pump in operation, a motor-driven ball-bearing centrifugal pump with upper casing raised to show interior construction, a motor-driven mine-gathering pump partly disassembled to show construction features, a sectional 25-hp. ball-bearing motor and a direct-current ball-bearing motor.

The following representatives will be in attendance: Messrs. K. W. Jones, T. D. Slingman, Jr., T. Edw. Morrison, F. S. Brown, R. L. Johnson, and G. J. Podlesak, and Mr. J. A. Manley, vice president, in charge of sales, will be in charge.

Fairmont Mining Machinery Company exhibit will consist of catalogs and bulletins of their products, and photographs and blue prints of plants and machinery.

C. N. Replogle

Flood City Brass & Electric Company will have on exhibition a Flood City room hoist, with permissible motor and starter, field coil testing machine for testing series wound locomotive field coils, electric controllers, especially designed for room hoist service, locomotive switch for locomotives with cable reel, samples of bronze for mine locomotives and mining machines, acid resisting bronze and stainless steel for mine pumps.

Mr. C. N. Replogle will be in charge of the exhibit and will be assisted by Mr. H. B. Hughes.

C. A. Scott

The General Cable Company's exhibit will comprise a display of Rome Super-Service cords and cables including high-voltage shovel cables, and an exhibit showing method of cutting. There will also be special locomotive cables, Rome Trenchlay non-metallic sheathed underground cable and standard cable accessories and jointing materials.

Mr. C. A. Scott will be in charge of the exhibit.

C. T. McLoughlin

General Electric Company will exhibit a 275 kw. mercury arc rectifier in operation, and a 200 kw. mining type synchronous converter with complete automatic searching equipment. General Electric service shop equipment mine locomotive parts, with exhibit showing how new features may be added to hauling locomotives. Line material exhibit. Laboratory exhibit of scientific interest.

The exhibit will be in charge of C. T. McLoughlin.

The Goodman Manufacturing Company will exhibit a new universal control low vein shortwall machine and a new 6-ton low vein gathering locomotive.

Exhibit will be in charge of J. D. James.

H. Macmillan

Hazard Wire Rope Company will display a "Freak Knot," full size, from a 1¾-in. hoist rope which was taken from the bottom of a mine shaft after an accident to the hoisting engine. Also all the special ropes designed by Hazard for peculiar and severe types of service. Flex-Set preformed rope. Improved flattened strand. Patent armored rope. Also ropes and interesting information for coal stripping operators.

Mr. Herbert Macmillan will be in charge of the exhibit. Mr. T. A. Keefe, district manager of their Pittsburgh office, will also be in charge, assisted by members of the sales organization from the principal coal fields.

F. L. Swabb

Heisler Locomotive Works will show a model locomotive exactly one-tenth the size of a 55-ton Heisler, showing in exact detail the driving mechanism of this locomotive. In addition, operating views of Heisler locomotives on mining operations will be shown.

The exhibit will be in charge of Frank L. Swabb.

B. G. Shotton

Hendrick Manufacturing Company will show perforated metal screens, Elevator buckets, perforated elevator buckets, "Mitco" interlocked steel grating, "Mitco" Shur-Site stair treads, Hendrick flanged lip screens, Hendrick perforated plates for vibrating

decks, "Mitco" armorgrid, Hendrick milled slot screens, Hendrick perforated metal grilles.

The exhibit will be in charge of B. G. Shotton.

N. S. Greensfelder

The Hercules Powder Company booth will consist of a mechanical display, which mounts and displays by movement the various products of the Hercules Powder Company explosives department.

Available at the booth will be booklets and pamphlets describing Hercules products.

Besides certain Hercules branch managers, salesmen, technical and service men, Messrs. N. S. Greensfelder, M. R. Budd, and T. Marvin will be present.

C. L. Herbster

Hockensmith Wheel & Mine Car Company will have an exceptionally interesting exhibit. They will be located in spaces 60-61, South Hall.

E. W. Wanner

Hulburt Oil & Grease Company will have on display several drums of the various densities of lubricating grease for use on coal mine equipment. They will also display their various systems of lubrication.

The exhibit will be in charge of E. W. Wanner.

E. B. Day

Hydrotator Company will show a moving picture of the Hydrotator in operation and will show a continuous movie on a projector. The movie will consist of animated presentation showing the principle involved in the Hydrotator process, together with pictures of various installations. The Hydrotator thickener and classifier will also be shown, as well as the coal cleaning apparatus.

The exhibit will be in charge of E. B. Day, assisted by W. L. Remick.

E. H. Alfree

The Ironton Engine Company display will consist of a complete Ironton Shaker conveyor in operation including the drive engine, through a 90-degree turn. This is similar to the display of last year with the exception of the 90-degree turn which is a new Ironton development first displayed.

The exhibit will be in charge of Mr. Alfree.

C. G. Sensenich

Irwin Foundry & Mine Car Company will show an all-steel, electric welded mine car. This car has been in service for the last six months, in a West Virginia mine. Also the Sensenich self-adjusting truck; a patented Exton-Timken wheel and sheave wheels.

The exhibit will be in charge of Chester G. Sensenich.

The Jeffrey Manufacturing Company plan to display their 44-C loading machine with a background of pictures, and possibly a portable moving picture of the machine in operation.

W. M. Dake

Joy Manufacturing Company will show the improved type 7-BU Joy loader, which has the same patented gathering mechanism used on all Joy machines, and with the exception of conveyor is identical with all improved type Joy loaders. This particular machine is designed for operation in seams ranging from 48 to 60 in. in thickness. The overall length of this machine is 24 ft., width 6 ft. ½ in., and the lowest overall height is 40 in.

The exhibit will be in charge of Mr. Walter Dake.

C. H. Brown

The Joyce-Cridland Company exhibit will consist of a complete line of every type of jack, including jacks for handline electric locomotives, heavy loaded coal cars, track jacks, and plain lever mine jacks, also an automatic lowering mine jack. They will introduce at this convention a 5-ton automatic lowering mine trip jack.

The exhibit will be in charge of Huston Brown.

Jones Flexible Conveyor Company will show their conveyor which is of the shaker type, with rope drive by means of which several units can be driven from one engine.

H. A. Busby

Keystone Lubricating Company will have on display a Keystone pneumatic lubricator fitted with two flexible hose lines for use in greasing mine car wheels. The exhibit will demonstrate the method of greasing both sides of the car at the same time. At the end of the flexible hose is used a Gresser mine car nozzle which connects with the Gresser fitting in the car wheel. Air pressure is automatically maintained in the lubricator by a motor compressor set equipped with a cut-in and cut-out switch. The display will include various types of Keystone safety lubricators and Keystone greases for mining equipment.

The exhibit will be in charge of H. A. Busby.

Jno. Griffen

The Koppers-Rheolaveur Corporation's exhibit this year will consist of a scene-in-action display measuring 4 feet by 6½ feet, which is a reproduction of a sealed discharge Rheolaveur plant for cleaning coal up to 6 inches in diameter, and an enlarged colored drawing of a free discharge plant with a series of pictures enlarged and framed showing the various installations of their

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equipment both anthracite and bituminous. In addition, they will have on exhibit a number of photographs of details of these installations mounted on a vertical display fixture. Photostats of flow sheets of these plants will also be included in this exhibit. An automatic stereopticon will exhibit slides showing further pictures of our various installations. Various photographs and pictures will be exhibited, illustrating the Carpenter centrifugal drier. This will be illustrated by framed pictures and diagrams of drier installations and its details.

The exhibit will be in charge of John Griffen.

The LaBour Company, Inc., will have in operation one of their self-priming centrifugal pumps, fitted with some glass-working parts and glass lines, so that the operation and air-handling ability of this pump is clearly demonstrated. Also two automatic gathering valves, which are especially designed for mine service.

Mr. G. C. Moore will be in charge of the exhibit.

W. C. Richards

A. Leschen & Sons Rope Company exhibit will consist principally of a full line of samples of wire rope required in the mining industry. Also some moving pictures of wire rope making and wire rope in operation.

The exhibit will be in charge of Walter C. Richards.

Allison Walker

Lincoln Steel & Forge Company will show a complete line of electric greasing systems for mine car trucks, locomotives, tipple machinery, shaker screens, etc., including their EM-200 Lincoln electric lubrigun, and standard plugs, and Lincoln electric lubriguns made in several different styles. They will be prepared to show how easy it is to grease a mine car truck a minute. The exhibit will be in charge of Mr. F. S. Barks, Mr. Allison Walker, Mr. C. R. Hooten, and Mr. H. N. Fitch.

J. W. Wilson

The feature of the Link-Belt Company's exhibit will be a working model of the Link-Belt-Simon-Carves wash box. Link Belt vibrating screen and Herringbone speed reducer exhibits will round out the display, which will have a background of enlarged pictures illustrating Link-Belt materials handling and power transmission chains and machinery and screening equipment. Link-Belt engineers from the various coal fields will be in attendance during the exhibit.

Macwhyte Company exhibit will show the internally lubricated rope that is arousing so much interest in the coal mining industry. This is accomplished by a high-grade grease, made liquid with heat and applied to the individual wires of the rope during fabrication. This grease hardens when it hits the cold

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wires and is spun into the strand, where it remains to lubricate the wires and protect them for the entire life of the rope.

Mancha Storage Battery Locomotive Company will exhibit their line of equipment, featuring several special items. This company manufactures the Type A and Type B "coal getter."

The exhibit will probably be in charge of Mr. Raymond Mancha.

H. A. Clarke

McGraw-Hill Publishing Company, Inc., exhibit will furnish complete information concerning the following publications: *Coal Age*, coal mining catalogs, McGraw Coal Mining Directory, Keystone Coal Buyers Catalog and Mine Directory.

Mr. H. A. Clarke will be in charge of the exhibit.

J. T. Ryan

The exhibit of the **Mine Safety Appliances Company** will feature the Edison Model H electric safety cap lamp — the latest development in safe and efficient mine lighting. The Edison Model H lamp employs a newly developed bakelite head piece, which directs the light where it can be most efficiently used, whether the man is working or traveling. New fireproof charging racks and equipment for Edison lamps will also be displayed. In addition, the M-S-A display will feature a complete line of first-aid materials, gas-detecting and recording instruments, respiratory protective equipment, including the Burrell all service gas mask, self-rescuers and McCaa two-hour oxygen breathing apparatus, rock dust distributors and rock dust testing kits, the M-S-A protective hat, safety clothing, signs, goggles, etc.

John T. Ryan will be in charge of the exhibit.

J. M. Hadley

The Mining Congress Journal exhibit will consist of display material of interest alike to operator and manufacturer.

Charts will be shown which give the territorial circulation of the magazine, its circulation compared to the number of mining operations in the United States and their buying power in each branch of the industry and percentage of total circulation by classifications.

In addition the booklet—"The Mining Industry; a $350,000,000 Market"—will be available together with display boards of advertising pages prepared by The Mining Congress Journal for advertisers, displays of sample text pages and lists of contributing authors.

The Mining Safety Device Company exhibit will consist of a motor operated tipple model showing a rotary dump, a bumper stop car feeder, and chain haul. The model operates with miniature mine cars which are loaded with coal. The model operates continuously and can be started and stopped at will. They will also exhibit a number of smaller models showing mine car cagers, feeders, and car stops.

The exhibit will be in charge of G. W. Merritt.

H. S. McClain

The Morrow Manufacturing Company exhibit will consist of a working model of a four-track tipple with three loading booms, slack conveyor, mixing or reassembling conveyor, rescreen conveyor and refuse conveyor. A belt conveyor will deliver the coal from the dump to the screens, the dump being located at the bottom of a slope. This tipple model will be built on a scale of 1½ in. to 12 in., or one-eighth true size. The tipple is so designed that the coal may be sized, hand picked and reassembled in any combinations required.

Mr. H. S. McClain will be in charge of the exhibit.

A. F. Weston

Morse Chain Company exhibit will consist of a stroboscope which is a piece of apparatus designed to show the action of the rocker joint of the Morse silent chain under actual operating conditions, by means of a synchronized Neon lamp which gives a slow motion effect. A triple reduction chain type speed reducer, as well as various samples of chain will also be on display. The newest application of Morse chain as applied to flexible couplings will be shown.

Mr. A. F. Weston will be in charge of the exhibit.

Mt. Vernon Car Mfg. Company will exhibit mainly their pit car loader mounted on a special set of slide rails manufactured by them, featuring the ease with which the loader moves from room to room, simplicity of construction, equipped with roller chain and easily repaired when it is necessary. They will also exhibit some cast iron wheels and a few forgings.

The exhibit will be in charge of Alfred E. Pickard.

R. W. Murray

The Murray Pump and Valve Manufacturing Company will display Murray all-wood acid resisting pumps, all-wood acid resisting gate, check, and foot valves, lead and wood lined acid resisting gate, check, and foot valves, bronze gathering pumps for mine service, centrifugal pumps and acid-resisting treated pipe. The wood pump is unique in that the water end is constructed entirely of wood. It is directly connected to a self oiling Timken tapered roller bearing power frame and is equipped with non-metallic acid proof plungers and all-steel gears.

The all-wood valves are similar in construction to the all-wood pump in that all parts coming in contact with the water are of wood. These valves have a working pressure up to 50 pounds.

The metal gathering pump is equipped with either all bronze acid resisting water end, or cast iron bronze fitted water end. Murray treated pipe is prepared especially for service in acidulous water.

The exhibit will be in charge of Robert W. Murray.

C. C. Whaley

The Myers-Whaley Company exhibit will consist of a Whaley Automat, the new coal loading machine recently developed which will be in operation; motion pictures of the Whaley Automat loading coal; a working model of the Myers-Whaley shovel and a number of photographs showing this machine operating under various conditions.

The exhibit will be in charge of Charles Whaley.

V. Frederiksen

The exhibit of the National Armature & Electric Works which is the first exhibit of their product before a national convention, will include a collection of armature coils and field coils representative of their product. This company specializes in mica-insulated, hot-pressed coils.

Mr. Victor Frederiksen will have charge of the exhibit.

National Carbon Company, Inc., will exhibit a full line of carbon, graphite and metal-graphite brushes, welding carbons and the Eveready Sunshine Lamp which is coming into use to supply the deficiency in sunshine, otherwise inherent in mining operations. The manufacture of carbon brushes will be shown in a very interesting manner by means of a continuous projector.

Mr. V. J. Nolan will be in charge of the exhibit for the carbon sales division of their company.

G. R. Farrell

The National Malleable and Steel Castings Company will show Naco cast steel steam shovel chains, also swivel hitchings, Naco steel single link hitchings, link hitchings, Naco steel mine car wheels, and the Willison mine car coupler.

The exhibit will be in charge of Mr. Geo. R. Farrell.

The Niagara Concrete Mixer Company, manufacturers of the Niagara counterflow screen which operates on the rotary principle is exhibiting their screens which are supplied in one, two and three-deck sizes. The design, construction and ability to continuously handle large quantities of material speedily are pointed out.

Norma-Hoffmann Bearing Corporation will exhibit a complete line of sample ball, roller and thrust bearings, including their new types of self-aligning and angular contact ball bearings in the metric sizes. Also a number of sectioned units and parts of mining machinery in order to show typical mountings of their ball and roller bearings.

The exhibit will be in charge of Mr. C. D. Kilham.

G. R. Whitnall

The Northern Conveyor & Mfg. Company will exhibit two new models of feeder conveyors employing sectional design and construction, which are new as applied to feeder conveyors. Also two new models of pit car loaders and a new machine representing radically new design in the pit car loader type of conveyor.

The following representatives will be in attendance assisting Mr. Geo. R. Whitnall, who will be in charge: Mr. E. M. Platts, Mr. L. L. Sammans, Mr. H. J. Burchart, Mr. D. G. James, and Mr. D. E. Crawford.

J. C. Wilson

Besides its regular extensive line of mine overhead materials, rail bonds and welding machines, the **Ohio Brass Company** this year will feature a number of new and improved safety and control devices. During the course of the past year several refinements have been incorporated in the new O-B automatic d. c. motor starter. Besides the automatic starter there will be shown a complete line of circuit breaker switches, ranging in size from 350 to 1,200 amperes. Safety switches employed in mine sectionalizing capable of handling loads up to 1,500 amperes as well as the new junction. Also the junior fused trolley tap rated at 3-30 amperes and the form-3 fused trolley tap rated at 100-400 amperes.

The regular overhead display will include such items as the new guard board and air gap hangers, frogs, splicers, clamps, and trolley wire fittings of numerous kinds.

The exhibit will be in charge of Mr. J. C. Wilson.

Osborne Register Company exhibit will feature the various types of scrip issuing register equipment manufactured by them. They are also showing as a part of their exhibition metal scrip.

N. C. Shaver

Penn Machine Company will feature the following products in their exhibit: Arc-weld rail bonds; trolley equipment, as follows: Combination trolley frog and section switch, section insulator switch, pole head and harp; flexible couplings; repair parts for mining machinery; gears and pinions.

The exhibit will be in charge of N. C. Shaver.

Pennsylvania Crusher Company will exhibit a working model of the "Pennsylvania" Bradford coal breaker and cleaner. This motor-driven model demonstrates the combined functions of crushing, cleaning and sizing. The automatic separation and discharge of harder refuse, such as wood, sulphur balls, slate, bone, rock and tramp iron is particularly interesting.

The exhibit will also include a small size Hammermill of their new Trojan series, equipped for preparing ROM coal for pulverizers, stokers, retorts and coke ovens.

A wealth of photographic illustrations, interesting samples of miscellaneous refuse and tramp iron removed by both Bradford breaker and Hammermill types, and samples of various kinds of coal, before and after preparation, will also be on exhibit.

Mr. John Alden Plimpton will be in charge of the exhibit.

C. Conrad

Pennsylvania Mining Machinery Corporation will exhibit pamphlets and photographs of their process.

The exhibit will be in charge of Mr. Charles Conrad.

J. M. Duff

Phillips Mine and Mill Supply Company will show an operating model of the Phillips Barkley gravity rotary dump, small model of the cross over dump, mine car wheels, plain and roller bearing, samples of various styles of plate work, of both mine cars and tipple equipment, screen and bearing bars, pans for face conveyors, mine car details, such as links and pins, bumpers, etc. Pamphlets describing their products will be available for distribution.

The exhibit will be in charge of J. Milton Duff.

C. W. Waterman

The Pittsburg Boiler and Machine Company will present literature showing what Pittsburg is doing to modernize mining, and other literature, showing details of the equipment manufactured for the coal industry.

The exhibit will be in charge of Mr. C. W. Waterman.

E. R. Bollinger

The Pittsburgh Coal Washer Company will exhibit one of their standard size 4 ft. by 10 ft. single-deck tandem Pittsburgh vibratory screens. It will be mounted with individual motor drive and equipped with Westinghouse squirrel cage induction motor, fan cooled, totally inclosed and Worthington emerald cord V-belts.

The exhibit will be in charge of E. R. Bollinger.

The exhibit of the **Pittsburgh Knife and Forge Company** will consist of various types of mine car couplings, drop forged swivels, mining machine bits, bit boxes, etc., as well as a display board showing the various type of drop forged links used in their couplings. They will also show several drop forged couplings which have been pulled to destruction for test purposes.

Portable Lamp & Equipment Company exhibit will include Wheat lamps, complete with chargin equipment in operation, an actual reproduction of an installation suitable for a mine lamp house. Representatives of Koehler Manufacturing Company, the makers of the equipment, including Mr. Grant Wheat, and the manufacturer's distributors, Portable Lamp & Equipment Company of Pittsburgh, including Mr. Geo. C. Nelms, Mr. W. K. Wilbur and others, will be in attendance at the booth.

National Exposition

C. L. Hensley

The Pure Oil Company will show a mine car wheel so constructed that the axle and bearings can be exposed to view while they are in motion, showing the exact action of our Poco mine car grease under actual working conditions. This exhibit will be driven by an electric motor, which will rotate the axle and bearing approximately at the same speed as a mine car travels under ordinary conditions.

In addition to the car wheel, they will show grease jars which will be filled with various mine greases and industrial oils. The grease jars will be left open and the public will be allowed to inspect the grease. The back of the booth will be covered with photographs of their new grease plant at Marcus Hook, Pa.

The exhibit will be in charge of C. L. Hensley.

The Post-Glover Electric Company will exhibit their P. G. steel grids for mine locomotives, mining machines, hoist, tipple motors, etc. A register will be in the process of manufacture showing the method of assembly, construction and material used in complete sets and parts.

They will also exhibit the Post Glover W. W. self-starters for fan and pump motors and a new automatic transfer switch for cable reel locomotives.

The exhibit will be in charge of Mr. J. M. Van Winkle and Mr. C. E. Nuckels.

F. E. Mueller

Roberts and Schaefer Company will introduce at the exposition a commercial size double compartment rewashing Menzies hydro separator, also details of triple compartment Menzies hydro separator with double rewash feature. Photographs of recent installations and model of mine car feeder will be exhibited, together with movies of Roberts and Schaefer Company's installations. Their full line of rotary car dumpers will be illustrated.

Frank E. Mueller will be in charge of the exhibit, assisted by Ray W. Arms.

L. R. Robinson

Robinson Ventilating Company will exhibit a model of reversible mine fan with air shaft and haulage way mounted underneath the fan model. Haulage way will be equipped with a track which will have an electric mine motor operating through this airway; a model of a disc type of fan for use in mines for development work; a model of a forced draft fan for power house work; a full sized tubing blower of the standard forward curve design which will be operated with 8-in. tubing; a tubing blower of the standard backward curve design which will be operated with 12-in. tubing. All equipment will be connected up so that it can be run when desired.

National Exposition

The exhibit will be in charge of L. R. Robinson.

H. D. Thomas

The Rock Springs Loader Company will show photographs and moving pictures of the duckbill in action in connection with the shaker conveyor.

Mr. Harold D. Thomas, mining engineer, assisted by Mr. William Greet, will be in charge of the exhibit.

F. J. Maple

John A. Roebling's Sons Company will have an exhibit consisting of samples of their famous "Blue Center" wire rope.

The exhibit will be in charge of F. J. Maple.

Edw. Webster

The Ross Screen and Feeder Co., will exhibit their Ross feeder, for stone, gravel, slag coal and coke. They will show four different types. This feeder consists of a curtain of heavy endless steel chains driven by an overhead tumbler and suspended to lie on the material and to travel with it.

The Joseph T. Ryerson & Son, Inc., exhibit will consist of a large display board 8 ft. 4 in. by 11 ft. 6 in., upon which will be displayed many of their products. In addition to this large display board, they will show alloy, stainless and tool steels, particularly adapted to the coal mining industry, and a display of their Glyco process bearing metals, together with special literature for distribution, covering items that are particularly adapted to the coal industry.

The gentlemen in charge of the exhibit are as follows: Mr. D. L. McCubbin, Mr. Voigt Proctor, Mr. L. S. Mueller, Mr. W. H. Currier, Mr. J. O. Groff.

E. H. Johnson

The Safety Mining Company will exhibit the Cardox cartridge in a new and improved model. Cardox is a non-explosive method for bringing down coal at the working face, employing the expansive force of liquid carbon dioxide in a reusable steel cartridge.

The exhibit will be in charge of Edwin H. Johnson.

Sanford-Day Iron Works, Inc., will exhibit the miniature coal mine equipped with automatic bottom-dumping cars and will show moving pictures of mines which are equipped with their automatic bottom-dumping car, both the single-automatic and the double-automatic. Also one or two full size cars showing late developments in mine car designs.

Mr. Geo. E. Jones, Jr., will be in charge of the exhibit.

A. Hagen

The exhibit of the **Simplex Wire & Cable Company** includes the following items. Various types of insulated wire and cable for mine use, including Tirex machine and locomotive cables; Tirex high voltage shovel cables; Tirex portable cord; Tirex shot fire cord; Tirex miner's lamp cord; shaft and borehole cables; non-metallic distribution cables. Those attending the booth will be: Messrs. G. L. Roberts, H. M. McFarland, W. H. Davis, W. F. Hruby, who will assist Mr. A. Hagen, who will be in charge.

The Simplicity Engineering Company will show their equipment at Booth 44.

S. K. F. Industries, Inc., will display a range of ball and roller bearings; several novel devices will portray visually the anti-friction features of S. K. F. bearings.

Those in attendance at the exhibit will be: R. H. DeMott, R. R. Zisette, J. W. Crafton, F. E. Ericson, V. A. Menaglia.

The Snap-On Wrench Company, of Chicago, Ill., will exhibit their line of automotive and industrial socket wrenches at Booth 61-A.

Streeter-Amet Company will exhibit a mine tipple weight indicating and recording device, which will be connected to a small mine platform scale. A moving car will pass over the scale and automatically record the weight while in transit.

H. F. Reck will be in charge of the exhibit.

C. B. Officer

The main features of the **Sullivan Machinery Company's exhibit** will be a Sullivan CD-4 track drill with Universal adjustability. A CR-3 rope feed room and pillar continuous coal cutter, new model. Several models of portable electric hoists, including 75 hp. scraper loader hoist and two smaller singlue drum hoists for car pulling.

The exhibit will be in charge of Charles B. Officer.

Wm. Simpson

Templeton, Kenly & Co., Ltd., will exhibit a complete line of Simplex automatic mine jacks for all general mine purposes, including a 5-ton capacity in three different heights for standard coal-cutting machines; 5, 7½, 10 ton jacks for all makes of coal-cutting machines that operate while on the track; also for every make of loading machine. Various capacity jacks designed for rerailing all sizes of mine locomotives and heavy mine cars. Sturdy, light-weight jacks of ample capacity for track work where weight of rail varies from minimum to maximum. Safety timber jacks for putting up round and square cross timber and heavy I-beams. Super-powered post pullers. Two types of jacks designed for straightening mine cars; 2-ton tension jacks, designed for stretching heavy mine cable, trolley wire and guy wires, pulling together broken chain hauls and to hold together ropes and wire while splicing; 5-ton capacity jacks for temporary mine props and for supporting, pulling and pushing mine conveyors; special ratchet screw jacks for supporting and bracing mine conveyors; several sizes specially designed small jacks used to support pit car loader conveyors; heavy capacity ratchet and gear jacks for rerailing railroad cars, heavy rock dump cars and larries.

The exhibit will be in charge of William Simpson.

E. R. Phillips

The feature of the **Timken Roller Bearing Company** exhibit will be a moving display demonstrating the thrust capacity of Timken bearings in mine car wheels and their performance under heavy loads. This will consist of a mine car wheel mounted on a vertical shaft, with one of the company's large steel mill roll neck bearings, weighing some thousands of pounds, set on top of it. The whole will be driven by a fractional horsepower electric motor through a silk cord. The rest of the exhibit will consist of an assortment of Timken bearings suitable for mine service.

The exhibit will be in charge of E. R. Phillips. Other representatives who will be present are: L. M. Klinedinst, E. C. Reither, J. A. Robinson, R. P. Proffitt, and R. P. Kelley.

The Tool Steel Gear and Pinion Company will exhibit gears and pinions used on mining machines and locomotives, especially main drive and intermediate gears and pinions which operate under the most severe conditions. Also a section of a large ring gear which illustrates the uniformity of hardening on the teeth.

The exhibit will be in charge of R. L. Reichling.

J. L. Goss

Bertrand P. Tracy Company will have on exhibit one of their latest type of pit car loaders. Also an improved type of cutter bar complete for short-wall mining machines, gears, pinions, bushings, etc., for use on mining machines and mine haulage locomotives, specially designed heavy duty type of Strom ball bearings for use on mine haulage locomotives.

Mr. J. L. Goss will be in charge of the exhibit, assisted by Mr. B. P. Tracy, Mr. E. P. Rauscher, Mr. J. C. Truax, and Mr. R. E. MacPherson.

The Traylor Vibrator Company exhibit will consist of one screen—single deck type FB2—and one conveyor.

The exhibit will be in charge of Mr. Paul Wigton.

G. R. Delamater

The W. S. Tyler Company will exhibit their latest type of multiple vibrator type 60 Hummer screen, a Ro-tap testing sieve shaker, a display model of a Hummer screen electric vibrator, a Delatester, and numerous samples of woven wire screen cloth.

They will also show a very beautiful

door panel, such as is turned out by their ornamental department, and which is something never before displayed at the American Mining Congress.

The exhibit will be in charge of G. R. Delameter.

A. A. Munsch

The United States Bureau of Mines will stress safety and special attention to barricades; the importance of barricades after mine fires and explosions; what their value in saving lives has been in the past, the necessity of instructing all underground workers on how to select a location and how to build a proper barricade with material at hand. Two simple types of barricades with visible cross section will be shown; this with large photographs, placards and publications together with copies of Miner's Circulars 25 and 35 on the Erection of Barricades During Mine Fires and After Explosions, for distribution, completes the exhibit.

The exhibit will be in charge of Mr. Albert A. Munsch.

The exhibit of The Utility Conveyor & Mine Equipment Company, of St. Louis, Mo., at Booth 61-B, will be made up of their line of conveying and loading machines and various mine equipment.

R. L. Edgar

The Watt Car and Wheel Company will exhibit a small working model of a new type dump car and this display will also demonstrate the Watt automatic switch and the Watt locomotive bumper. This working model will be complete in every respect. They will also have a Watt rail bender and straightener machine in operation, showing how easily it is to bend or straighten 40-pound rails.

They will show a life size locomotive bumper and several model mine cars built one-quarter size, which shows the actual detail construction of the various types of cars now in use.

The exhibit will be in charge of R. L. Edgar.

Waverly Oil Works Company will exhibit the various types of lubricants which are used in coal mining, as well as other industrial uses. Also the various types of packages in which Waverly oils and greases are marketed, and will have available for distribution, literature on the proper type of lubricants for the different operations.

The Weinman Pump Manufacturing Company will exhibit and have in operation their standard type "P" anti-acid bronze electric self-oiler mine gathering pump, and a display of various other types and sizes of mine pumps which they manufacture as well as numerous parts of such pumps.

J. P. Jordan

The Westinghouse Electric and Manufacturing Company will show the following features of their equipment: An automatic mining substation, a locomotive, permissible motors and control, line material, cog belt drive, Westinghouse-Nuttall gears, renewal parts and their fan cooled motors.

The exhibit will be in charge of J. P. Jordan.

J. B. Haskell

The West Virginia Rail Company will show complete steel room turnout units built with new type steel turnout ties. Their entire line of steel ties for mine and industrial work. A newly developed light parallel throw for room turnout, and an exhibit of their entire line of steel rails as rolled by their company; also a newly developed composite wood-steel mine tie.

The exhibit will be in charge of J. B. Haskell.

Woodford Engineering Company, Chicago, Ill., will be located in Space 115. For further details see exhibit.

ENTERTAINMENT

Features of the Week in Cincinnati

MONDAY, MAY 5, 8 P. M.

Informal Reception and Motion Pictures, Ball Room, Gibson Hotel.

WEDNESDAY, MAY 7, 7 P. M.

Dinner Conference on Mining Engineering Education, Gibson Hotel.

THURSDAY, MAY 8, NOON

Luncheon, Board of Directors, A. M. C.

6.30 P. M.

Mining Congress Review—Dinner, Entertainment, Dancing, Roof Ball Room, Gibson Hotel.

FRIDAY, MAY 9, NOON

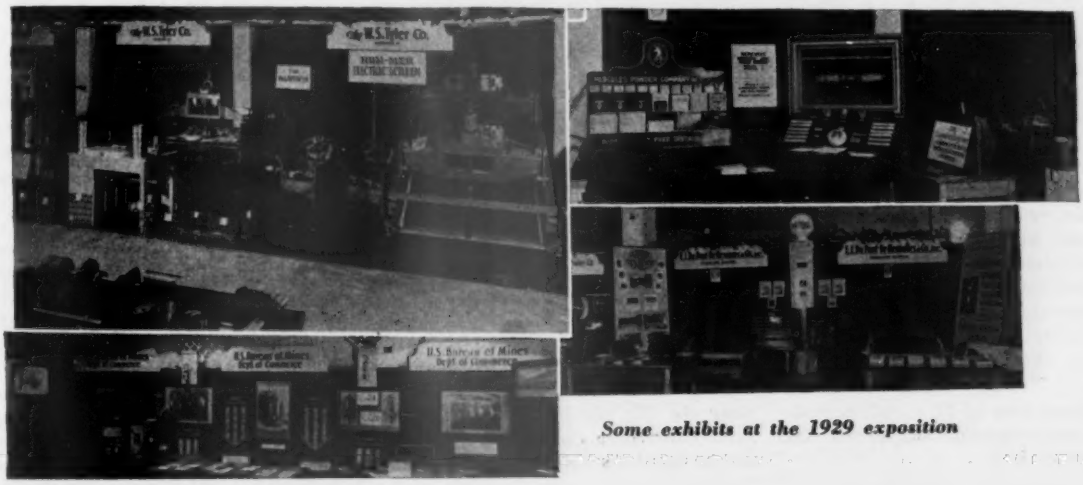
Luncheon, Manufacturers Division, Gibson Hotel.

8 P. M.

Informal Dance, Ball Room, Gibson Hotel.

Special Entertainment for the Ladies. (*Information at Registration Desk.*)

Golf privileges of the various country clubs, through courtesy of Cincinnati Coal Exchange.



Some exhibits at the 1929 exposition

LEGISLATIVE REVIEW

INTEREST in the legislative activities of Congress continues to center around tariff revision, although the present act is now in the hands of the conference committee. Senator Watson, of Indiana, one of the conferees, has predicted that the bill will be ready for reporting back to the Senate by the end of April. The Senate acts first upon the conference report.

Changes in the zinc ores and concentrates paragraph which were written into the measure in the Senate in February were agreed to. The paragraph now reads: "Zinc-bearing ores of all kinds, except pyrites containing not more than 3 percent zinc, 1½ cents per pound on the zinc contained therein." The House rate was the same as it is in the present law—less than 10 percent metallic content, free; 10 to 20 percent, ½ cent a pound; 20 to 25 percent, 1 cent a pound; 25 percent or more, 1½ cents a pound.

The Senate rate of 1 cent a pound on the metallic content of manganese ore or concentrates containing in excess of 10 percent metallic manganese was adopted. The House rate of 1 cent a pound applied to 30 percent manganese or better.

The conference agreed to the House rate of $1.125 a ton on pig iron, as against 75 cents written into the bill by the Senate. This action maintains the existing rate which has been in effect since President Coolidge proclaimed a 50 percent increase in the 1922 rate under the flexible provision of the law.

On aluminum and aluminum scrap and alloys, a rate of 3½ cents a pound was agreed to, as against 5 cents in the House bill and 1922 act and 2 cents in the Senate bill. On sheet and bar aluminum, a tax of 7 cents a pound was agreed upon as against 9 cents in the House bill and existing law and 3½ cents in the Senate bill.

On aluminum utensils, for table, household and kitchen, the conferees adopted a duty of 8½ cents a pound plus 40 percent ad valorem. The existing law of 11 cents plus 55 percent, which had been maintained by the House, was cut in the Senate to 25 percent.

The conference adopted the Senate rate of 15/32 cents a pound on crude magnesite. The House rate was 5/16 cents.

The Senate rate of $1 a ton on crude feldspar was adopted, as against the House rate of $1.50.

For bentonite, the Senate classification was agreed to, providing $1.50 a ton on unmanufactured, and $3.25 on manufactured.

A compromise was effected on the fluorspar rates. The House had placed a duty of $8.40 a ton on all fluorspar, and the Senate revised this to $5.60 a ton on fluorspar containing more than 93 percent calcium fluoride. The rate agreed to in conference places a duty of $5.60 a ton on over 97 percent calcium fluoride content, the $8.40 rate remaining on fluorspar under 97 percent calcium fluoride.

The Senate classifications and rates for mica were adopted, as follows: Unmanufactured, valued under 15 cents a pound, 4 cents a pound; valued above 15 cents, 4 cents and 25 percent ad valorem. Cut or stamped to dimensions, 40 percent ad valorem. Films and splittings, not cut or stamped: not above .0012 in. thick, 25 percent ad valorem; over .0012 in. thickness, 40 percent; films and splittings cut or stamped to dimensions, 45 percent ad valorem; plates and built-up mica, and manufacturers of mica, 40 percent ad valorem; untrimmed phlogopite mica, 15 percent ad valorem; mica waste and scrap, valued at less than 5 cents per pound, 25 percent ad valorem; valued at more than 5 cents per pound it shall be classified as mica, unmanufactured, ground or pulverized, 20 percent ad valorem.

The duty on graphite, crystalline lump, chip or dust, was set at 30 percent ad valorem, as against the House rate of 25 percent and the Senate of 2 cents a pound. For crystalline flake a compromise rate of 1.65 cents a pound was agreed to.

Pumice stone will be dutiable at ¾ cents a pound, the Senate rate. The House had a rate of 55/100 cents.

The Senate rate of 25 percent ad valorem on lithium, beryllium and caesium was adopted, these items being on the free list in the House version of the bill.

House to Vote on Silver

Senator Pittman's amendment to the tariff bill providing a duty of 30 cents an ounce on silver and silver-bearing ores and mattes will be voted upon separately in the House of Representatives after the bill has been finished by the Joint Conference Committee. This procedure has been decided upon inasmuch as silver was not considered at all by the House.

Senate Passes, House Discards Norris Muscle Shoals Proposal

The Senate voted in favor of the proposal of Senator Norris, of Nebraska (S. J. Res. 49), providing for the operation of the Muscle Shoals project by a Government-controlled corporation. The measure was in virtually the same form as the Norris proposal of two years ago, which was adopted by Congress and "pocket-vetoed" by President Coolidge. It provided for the creation of the "Muscle Shoals Corporation of the United States," directed by a board of directors of three named by the President. The corporation would be directed to operate the nitrate plants for the production of nitrogen and also to conduct experiments in nitrogen production. The Cove Creek Dam would be used as a reservoir for the power project, and the corporation would have full authority to sell all surplus power generated at the Muscle Shoals and Cove Creek dams with the stipulation that states and municipalities be given preference.

The Norris resolution and other Muscle Shoals proposals were subsequently discarded by the House Committee on Military Affairs and a sub-committee appointed to draw up a bill to lease the project to a private corporation with an alternate plan for Government operation in the event a satisfactory bid is not received.

Public Lands Investigation

The Senate passed the bill authorizing the appropriation of $50,000 for making a study and report on the administration and conservation of the public domain. The measure as it passed the Senate is in the form of an amendment by Senator Bratton, of New Mexico, to the original bill of Representative Colton, of Utah. The Bratton amendment does not make any material changes in the Colton act, which was passed by the House in January, the changes relating only to the administration methods. The commission which is to make this investigation has already been appointed, with former Secretary of Interior Garfield as chairman and consisting in all of 20 members.

Geological Survey Funds

The Interior Department appropriation bill as passed by the Senate increases the Geological Survey's appropriation for engraving and printing geologic and topographic maps from $124,000 to $199,000, the former amount being the House appropriation. The appropriation for topographic surveys in various parts of the United States was increased from $736,000 to $744,000.

Bethlehem-Youngstown Merger

Representative LaGuardia, of New York, introduced a resolution in the House directing the Attorney General "to investigate the proposed merger between the Bethlehem Steel Corporation and the Youngstown Sheet and Tube Company and determine its legality and the connections and participation, if any, of the United States Steel Corporation in the matter and to take such immediate preliminary action as may be necessary to prevent the consummation of any contemplated or existing contract for the transfer of stock and property as a part of such merger or unlawful agreement in restraint of trade."

Forest Products Laboratory

The Senate passed a bill authorizing the Department of Agriculture to establish a forest products laboratory at the University of Wisconsin and appropriating $900,000 for equipment and research.

A summary of other pending legislation follows:

S. Res. 224. Mr. Schall (Rep., Minn.). This resolution provides for an investigation and report by the Senate Public Lands Committee as to the mineral and other value of 1,000,000 acres of land known as Hunters Island between Lake (Superior and the Lake of the Woods in Minnesota.

Representative Pritchard (Rep., N. C.) introduced a bill to establish an assay office at Murphy, Cherokee County, N. C., to serve North Carolina, Georgia, and Tennessee.

Hoover Vetoes Coinage Measure

President Hoover on April 22, vetoed H. R. 2029, an act to authorize the coinage of 10,000 silver 50-cent pieces commemorating the seventy-fifth anniversary of the Gadsden Purchase, on the ground that it would be a misuse of the Nation's coinage system and increase counterfeiting. In returning the bill to Congress the President asserted that similar proposals before Congress in the aggregate jeopardize the principles of sound coinage.

"The monetary system of the country is created and exists for certain well-defined and essential purposes," the President said. "Sound practice demands that it should not be diverted to other uses." He added that "experience has demonstrated that the necessities and convenience of the people can best be served and the integrity of our coins can only be protected from counterfeiting by limiting the number of designs with which in the course of time the public can become thoroughly familiar."

He pointed out that during the past 10 years 15 such special coins have been issued, an aggregate of over 13,000,000 such coins having been authorized. There are now pending before Congress five other bills for such coinage, and before the Treasury Department several other requests for support to proposals of the same character.

The House sustained the veto the following day by a vote of 243 to 96.

H. R. 10650. Mr. Celler (Dem., N. Y.). This bill proposes to reorganize the Federal Power Commission by appointing a commission of three members to replace the present body, which is composed of members of the Cabinet. A similar bill by Senator Couzens (Rep., Mich.) has been reported by the Senate Committee on Interstate Commerce.

H. J. Res. 254. Mr. Colton (Rep., Utah). This bill calls for surveys of power possibilities in Arizona, California, Colorado, New Mexico, Nevada, Utah, and Wyoming along the Colorado River project. Irrigation.

H. R. 10933. Mr. Green (Dem., Fla.). Provides $50,000 for establishment of a naval stores experiment station in Florida.

H. J. Res. 251. Mr. Snell (Rep., N. Y.). Authorizes a commission to investigate and report on plans to equalize the burdens and minimize the profits of war. (Passed by the House.)

H. J. Res. 244. Authorizes invitations to the states and foreign countries to exhibit and send delegates to the international petroleum exposition to be held at Tulsa October 4-11. Reported by House Committee on Foreign Affairs.

S. Res. 229. Mr. Thomas, (Dem., Okla.). This resolution calls on the Treasury Department for a report showing the companies and the amounts of oil or gasoline imported during the last three years and the ports of entry. (Passed by the Senate.)

H. R. 10625. Mr. Hudson (Rep., Mich.). This bill would forbid the discharge of oil into navigable waters.

H. R. 8154. Authorizes oil and gas leases on lands in or under railroads or other rights of way. (Passed by the House.)

S. Res. 220. Mr. Wheeler (Dem., Mont.). This resolution calls for an investigation by the Department of Justice as to whether corporations and associations selling oil and gasoline in Montana are violating the anti-trust laws by fixing prices or by other practices. (Passed by the Senate.)

H. R. 10343. Mr. Johnson (Rep., Wash.). Proposes to apply quota limits to immigration from Mexico and other Western Hemisphere countries. (Reported by the Committee on Immigration.)

H. R. 10122. Mr. Jones (Dem., Tex.). Provides for state regulation of monopolies, trusts, chain stores, combinations, and holding companies.

S. J. Res. 161. Mr. Couzens (Rep., Mich.). This resolution would suspend the authority of the Interstate Commerce Commission to approve railroad consolidations.

H. R. 6846. Provides for the coinage of five hundred thousand 50-cent pieces in commemoration of the three hundredth anniversary of the founding of the Massachusetts Bay Colony. (Passed by the House.)

H. R. 10885. Mr. McLeod (Rep., Mich.). This bill proposes to tax the sales of corporate securities on margin.

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Wisteria vines covering the old amphitheater at Arlington National Cemetery

Mechanization Report No. 30-5.

Personnel Training with Mechanized Loading

By G. B. Southward

Mechanized loading has not brought about the elimination of men and no machine has yet been introduced underground which is entirely automatic in its operation. Since machines require men to operate them the success or failure of the work is directly dependent on the efficiency with which these men perform. In the earlier days of mechanized loading when the main object was to demonstrate the mechanical performance of the loading equipment the only need was for one or two trained machine operators and these men were instructed by demonstrators furnished by the equipment manufacturing companies. Now that mechanized loading has been developed to a production basis the tonnages which can and should be produced are seen to be far beyond the limits which were first considered possible but in order to produce these tonnages economically it is being recognized that trained men are essential not only for the loading but also for all of the other related operations of mining.

Mechanized loading requires radical changes from hand methods and men accustomed by long experience to hand mining practices do not automatically fit into a machine operation. In time they will adapt themselves to the machine requirements but this is a slow and costly method for the company and a high degree of efficiency can not be expected from the operating crews unless they receive some amount of training or instruction. Before, however, the company adopts a program for personnel training or education it should consider what the needs are and what objects are to be accomplished.

Preliminary Training Steps

One of the first steps which should be undertaken by a company to make its personnel training effective is to convince the men that machine methods have advantages over hand loading, and that the company not only expects that their own operation will succeed but intends to make it succeed. Once the men are convinced of this it does not require much intelligence on their part to realize that if they themselves do not make the operation go, someone else will. An actual installation is the only means of demonstrating the success of the operation. Some companies will first put in only one loading unit and bring it to a fairly high degree of efficiency before others are added, other companies discontinue all hand work when the loading equipment is installed and put the entire mine on a 100 percent mechanized basis. In the latter case the only employment which the company has to offer is in connection with the machines and the men who operate them know that their jobs depend directly on the success which they are able to make. There is probably no more forceable way than this of convincing the men that the company is in earnest and is definitely committed to mechanized loading.

Another important preliminary step is the proper selection of the men who will be employed on the loading machine crews. Some men are naturally unfitted to perform certain operations and it is a waste of time on the part of any company to try to force these men into jobs which they are not capable of filling. In the selection of the personnel there have been as yet few if any rules developed that can be applied in all cases and so far the official's own personal knowledge of the men has been their only guide. It has frequently been found that men of the Nordic races make the better machine operators and it is usually true that the younger men are more easily adaptable to new methods than the older men. However, there are quite a number of exceptions to both of these generalizations.

Training men for mechanized loading is recognized as necessary to insure correct operation and is found effective in increasing the productive efficiency. New mining practices should be determined by the management. Different types of machines require different methods of training and instruction for the operating crews.

The best method for training men depends upon a number of different factors, and no one single method has been found effective for all cases. There are, however, several things which do apply to every mechanized operation and should be embodied in any system of training for any type of equipment. The first is to make the men realize that they must discard tradition and that correct hand mining practices do not necessarily apply in a machine operation. The second idea is to impress the men with the importance of team work. The third is to have the men accept the discipline which is necessary in group working. These ideas are all decidedly new to the contract miner who has always been accustomed to doing things in a certain way, without particular regard to the other men or other operations in the mine and with more or less freedom to regulate, according to his own desire or convenience, the hours which he works and the amount of work which he would do during one shift. The importance of having the men accept these three points can not be over-estimated.

Mechanical Loaders

Each type of equipment requires a working organization which is different in some respects than that required for the other types. A mechanical loading operation will usually have the working force divided into five separate gangs as follows:

1. Machine cutting.
2. Drilling and shooting.
3. Loading.
4. Gathering.
5. Track and timbering.

An organization of this kind provides the management with an opportunity of selecting men best suited to do certain kinds of work and the fact that the men are used almost entirely for one operation makes it possible to train them to a very high degree of efficiency. The crews for pit car loading are organized in much the same way as with mechanical loading.

Conveyors and Srcapers in Long Face Mining

Conveyor and scraper operations are organized along similar lines but the organization varies with different mining systems. In long face work it is customary to divide the crew into two gangs, one for the loading and one for the non-productive work of cutting, drilling, timbering, and setting and moving the equipment. Where the conveyor is hand lpaded the main object of training the shovellers is to teach them to load greater tonnages with less labor. The shoveling motions for conveyor loading are entirely different from those used with mine cars, and men accustomed to mine car loading are apt to do a large

amount of unnecessary lifting and throwing the coal when they are first employed for conveyor work.

The non-productive shift requires men of higher intelligence than the loading crew. The methods of roof timbering are determined after much study and experiment and the success of the long face operation is directly dependent on the success of the roof action. The men who are directly responsible for setting and removing the timbers, if they are intelligently selected, will soon develop a very accurate knowledge of what can and can not be done but it is up to the management to see that their work is directed along the right lines and the proper methods. The proper way of setting the equipment and the operating limits of the machines must be correctly understood so that there is no attempt to make the equipment perform beyond its design and that there is an attempt to have the operation up to the limit of the machine capacity. The management should decide these questions and should train and instruct the men to follow the practices which are formulated.

Conveyors and Scrapers in Rooms and Entries

An operation with conveyors or scrapers in driving rooms and entries usually employes a small crew which works in a continuous cycle performing all of the operations of cutting, drilling, shooting, timbering and loading, and moving the conveyor. An organization of this type requires a high degree of team work and it is essential that the men selected for the crew should be able to perform all the operations and should be trained to work together. A certain amount of instruction should be given to these men in order to reduce the lost motion which is apt to occur and to have them employ the proper methods of shooting the coal, timbering, and operating and taking care of the equipment.

Training and Instruction Methods

The two methods of training men now in use are by (a) Practical instruction underground and (b) Meetings or classroom instruction. Each of these two methods are limited to certain operations or certain phases of mining. Classroom instruction is not particularly effective for teaching men the proper way of hand shoveling onto a conveyor or the correct way of operating the controls of a loading machine. Meetings, more or less informal, have been found very satisfactory for discussing some of the broader phases of mechanized mining with the more intelligent men of the machine crews and with the mine officials of the company who are directly in charge of the work underground. Such questions as the mining systems, roof support, gathering haulage plans can be discussed in meetings of this kind and valuable ideas can be exchanged between foreman or men engaged on different loading crews. Successful practices and minor details for operating and maintaining the equipment as well as any new methods which may be proposed by the management of the company can also be brought up for consideration. A further valuable purpose is served by stimulating the interest of the men and in encouraging them to make suggestions and it is probably true that the efficiency which has been reached by mechanized loading at the present time is largely due to the interest and the improvements made or suggested by the men themselves.

The importance and the advantages of meetings and classroom instruction should not be overlooked but in the final analysis it is the actual performance underground which determines the economic success of the operation. It is therefore probable that the methods of training men at the working face should have first consideration by a company that is mechanized or that is installing mechanization. It is not yet the practice to employ a man solely as underground instructor although in time this may be done and for the present the men are being trained by the mine officials and by placing them with experienced crews. With mechanical loaders it is usually customary to put on one or two new men at a time with a machine crew of experienced men. In conveyor mining, particularly in room work, it is often the practice to take an experienced man from an operating crew and put him in charge of the men employed for the new installation.

For the past few years the productions made by all types of equipment have shown a steady and rapid increase in the tonnage mined. This is partly due to improvements in the construction of the machines but the larger part is directly due to better operating methods and higher efficiencies on the part of the crews. Their efficiency has been learned through experience but it is no longer necessary for any company to go through this costly method of having the men train themselves. It is true that mechanized operations have not yet become standardized but it should be recognized by any operating company that there is a right and a wrong way to perform all of the operations in connection with machine use and that their men should be instructed and forced to use the right way.

It has been the practice in hand mining to accept an applicant for work at his own valuation and if he stated that he was a machine runner or a motorman he was apt to be put in charge of the equipment without any examination. This method has been extremely costly in maintenance and repair and has long been discarded by other industries. For instance, it is hard to imagine that a railroad company would employ a locomotive engineer without definite assurance that he was an experienced man. We have not yet reached the point of adopting railroad methods with mechanized mining but we have most certainly reached the point where untrained men should not be employed to operate costly machines. The repair bills on underground equipment due to breakdowns from improper use would pay for a large amount of training and instruction.

RECORD PRODUCTION OF FUEL BRIQUETS IN 1929

The production of fuel briquets in this country in 1929 attained record proportions, the total output being 1,212,415 net tons, valued at $9,515,205, according to reports furnished to the Bureau of Mines by the operators of briquetting plants. It was the first time in the history of the industry that the production of briquets exceeded 1,000,000 tons. The figures represent an increase of 28 percent in tonnage and of 23.5 percent in value over the preceding year. They represent also a gain of 21.8 percent in production and 11.5 percent in value over the previous records established in 1926.

The central states are credited with the larger part of the 1929 production of fuel briquets, amounting to 788,160 net tons, valued at $6,409,755. Production in the eastern states was 324,967 net tons, valued at $2,030,837, while the Pacific Coast states produced 99,288 tons, having a value of $1,074,613.

The average value of fuel briquets f. o. b. producers' plants for the central states was $8.13, a decrease of 25 cents from 1928. The average value for the state of Pennsylvania was $6.22 as compared with $6.38 in the preceding year.

A total of 1,187,939 tons of raw fuel of all kinds was briquetted. Of this amount, 34 percent was anthracite and semi-anthracite, 60 percent semi-bituminous and bituminous coal, and 6 percent was semi-coke and carbon residue from manufacture of oil gas.

Five new plants began commercial operation during the year, while one plant active in 192 produced no briquets for sale in 1929, so that in 1929 four more plants were in operation than in the previous year.

Imports of fuel briquets in 1929 were 89,458 net tons, an increase of about 25 percent over 1928. About 88 percent of the total importations in 1929 were received at Massachusetts ports, and over 94 percent of the total originated in Germany.

COAL

NEWELL G. ALFORD
Editor

Practical Operating Problems of the Coal Mining Industry

WILDWOOD — A 100 % Mechanized Mine

By W. P. Vance *

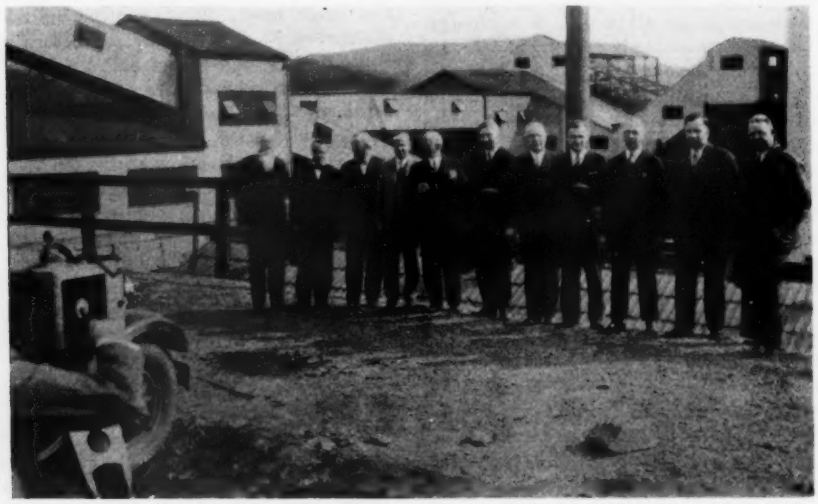
WILDWOOD MINE is located on the main line of the Baltimore and Ohio Railway about 12 miles north of Pittsburgh. The mine operates in the Thick Freeport bed, which at this property average about 8 ft. in height. The seam in the mine consists of two parts, a top bench and a lower, which are separated by 12-in. to 14-in. of bone and boney; cover averaged 350 ft. with a black slate top immediately over the coal seam and a hard fire clay bottom.

In planning and developing this property, we have kept in mind at all times that this plant should not merely mine but should mill or refine its product; that the plant should be capable of producing a coal which would meet the requirements of various power plants, for metallurgical purposes, as well as producing a coal suitable for steam and domestic purposes; that it should be equipped in such a manner that coal could be produced and refined in the most economical manner, consistent with the production of a quality product; that the equipment and procedure should be such that at all times a positive control could be had over all operations in order to produce a product which would be uniform as to size and quality. We also desire to follow all safety practices, in so far as possible, as recommended by the United States Bureau of Mines, American Mining Congress, and the Pennsylvania State Department of Mines.

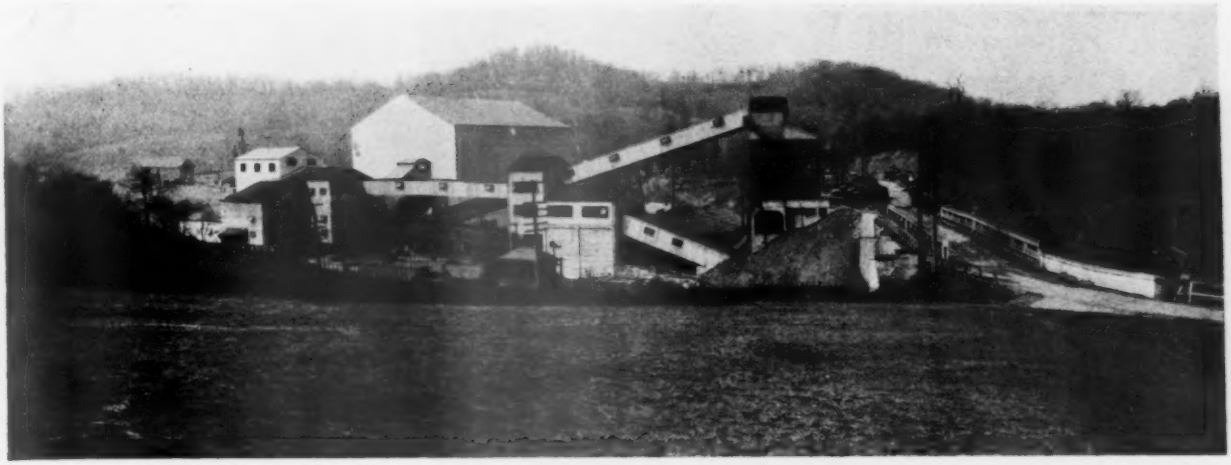
In employing our men we have considered that these men are not merely miners, as spoken of in the ordinary usage of the term, but are for the most part machine operators, mechanics and electricians. All of our men pass a very rigid preemployment medical examination, and we have a form filled out which gives us a very complete history of the man himself and his services prior to coming to our mine.

The first operation in the day's work is testing by the fire boss, who inspects the mine for gas, for bad roof, or other hazards which might endanger the lives of the men or damage the equipment. In fact, it is a practice to inspect each working place before men or machines are allowed to enter for the performance of any of their duties. When the men come to work they first enter the wash house, where they change from their street to mining clothes, which are warm and dry for them upon their arrival. They then pass through the lamp house, where approved battery lamps are issued and where they punch the time clocks. By the use of these clocks an accurate record is kept of each employe. When leaving the mine after their shift, in addition to punching the time clock they report on another clock the injuries which they

* Chief Engineer and General Superintendent, Butler Consolidated Coal Co.



Directors and Operating Officials. Left to right—Z. P. Lauffer, director; J. H. Fletcher, of A. & G.; S. Sherwin, vice president; C. A. Wilder, assistant secretary and treasurer; Geo. C. Stewart, director; T. W. Phillips, Jr., chairman of board; Judge Aaron E. Reiber, director; R. E. Sprenkle, secretary and treasurer; C. F. Hosford, Jr., president; W. P. Vance, chief engineer and general superintendent; E. J. Weimer, superintendent, Wildwood Mine.



General View of Plant

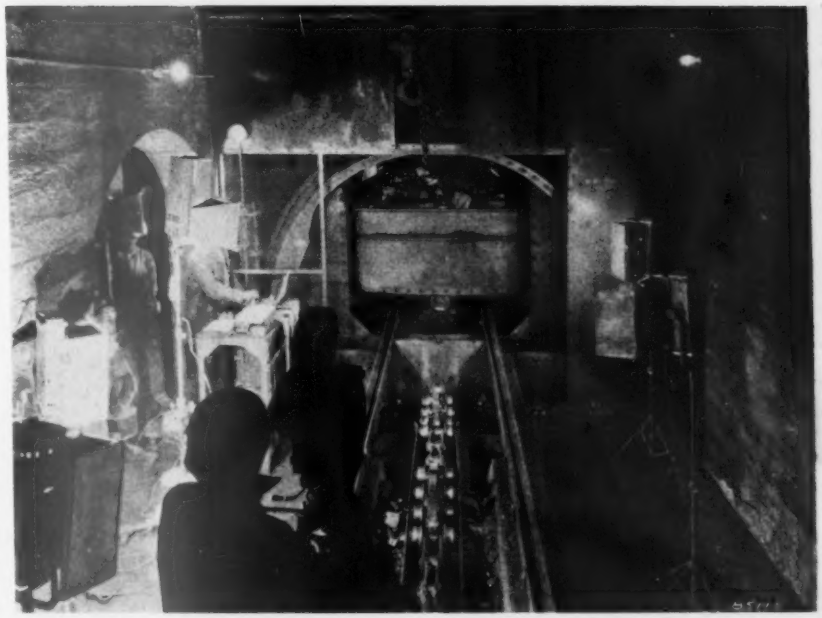
Retail bins at right, office behind them and roof of shops, wash house, etc., showing to their left. Belt conveyor structures passing through hoist house in center. Cleaning plant is large building to left center. Tipple and clean coal bins at left.

may have received during the shift. In traveling to the face the men travel a separate manway from the opening to the working face, and are not at any time exposed to haulage or other mechanical hazards.

Face Preparation

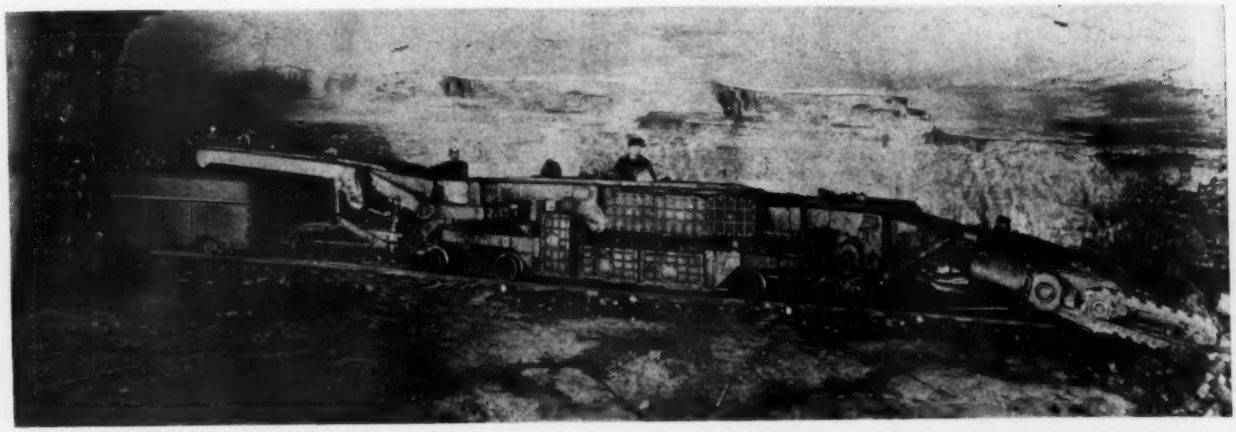
Once arrived at their respective sections the men immediately proceed with their duties in the work at the face. A definite cycle is followed, the first operation of which is the setting of sights by the engineers, as all working faces are driven according to a predetermined plan. After this the trackmen come in and place sections of track on which the cutting, drilling, and loading machines work. These sections are all of uniform length, as we have found that this is an aid toward obtaining a maximum uniform depth of cut by the cutters. The track is levelled up with much greater care than is necessary in the ordinary non-mechanical operation, for during the cycle of operations we will have working on this track machines weighing as much as 32 tons, which subject it to very great strain.

The drilling is done by a track-mounted drill, self-propelling, of the rotary type, with automatic feed and reverse. Exceptional care is taken in the locating and drilling of these holes, as we have found that this is very essential to proper shooting of the coal and preparation for the loading operation to follow. The machine is equipped with an 8 hp. continuous rated, permissible type motor, giving it sufficient capacity for continuous operations. This drill, as well as all other equipment operating at the face, is of the government approved, permis-



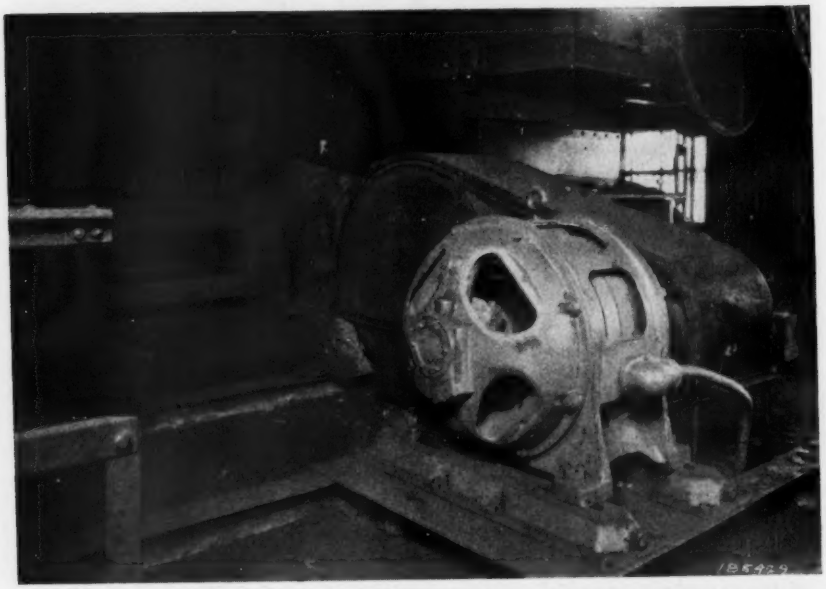
All set to take a movie of the rotary dump

A fall of coal showing results of proper cutting, shearing, drilling and shooting



Oldroyd Loading Machine
Equipped with 13 Government approved explosion proof motors and control. Capable of loading 5 tons in 1¼ minutes. Machine is 48 ft. long and weighs over 30 tons

Front end of Oldroyd loading machine



Crushers installed in tipple to crush all or any part of output to any desired size

sible type. At the present time these drills are drilling over one hundred 9-ft. holes per shift, using from four to eight holes for each working face. In this connection, we have found that we get much better preparation by increasing the number of holes and decreasing the amount of explosive used per hole. We have also increased the length of our thread bar in order that we may obviate the necessity for changing drills during the drilling operation. We find that this has increased the speed of drilling considerably.

When the holes are drilled, the cutting machine moves into the face. At the present time we are using the Oldroyd universal cutter, as we felt that it was absolutely essential that all of our cutting operations be done by one machine in order to keep the number of machines operating on the truck at the face at a minimum. This machine is capable of cutting from a place 6 in. under the rail, to a place some 7½ ft. above the rail, and can also shear in any position between points 4½ ft. to each side of the center.

Prior to the placing of the cleaning plant in operation, we made our first cut in the top bench of impurity, known as the boney. The cutter bar was then dropped down to the bone, and a second cut taken which entirely removed all impurities from the seam. The cutter bar was then turned and the shear cut placed. This last cut, together with our drilling and shooting, has enabled us to produce a much higher percentage of lump than is usually obtained from narrow workings. At the present time we are cutting 14 faces per shift, each face being cut three times the width, averaging 15 ft., and the depth of cut being 9 ft.

We have found that in order to secure

the best preparation it is necessary that the shots be placed with great care, and after much experimental work we have finally located our holes and the charge in such a manner that we feel we are obtaining a maximum amount of lump coal. These shots are fired with a magneto one at a time, the bottom holes being shot first. All caps are kept short circuited until connected with the magneto. We have found one principal advantage of correct placing and shooting of the charges to be a straight rib line without uneven bumps, which if left would delay the loading operation considerably. At the time the movie was taken of the operation of the Wildwood mine we developed some very interesting shots, the pictures of the shooting being particularly interesting. It was necessary in taking these pictures to determine just how close to the face the lamps and motion-picture camera could be placed without exposing them to injury. In taking these pictures special reflectors were used, in each reflector there being placed two 1,500 watt mazda lamps. Thirty-five of these reflectors were used, giving a total illumination of approximately one-quarter million candle power on the face. The accompanying photograph showing a shot of coal prepared ready for the loading machine indicates the excellent results which are obtained by the proper drilling, cutting, and shooting of the face.

Left, primary 300-ton Peale-Davis table. Center, clean coal conveyors from cleaning plant to clean coal bins in tipple. Right, secondary 300-ton Peale-Davis table.

Loading

At the present time we are using two types of loading machines, the Joy and the Oldroyd. The Oldroyd is the larger of the two, our first machine being 57 ft. in length and weighing approximately 32 tons. This machine is equipped with 13 Government approved, permissible type motors. All control equipment is mounted on the sides of the machine in order to facilitate inspection and repairs. The machine consists of three main parts: the front, or digging boom; the center portion of the machine mounted on the trucks; and the rear, or discharge boom. Both the front and rear booms may be raised or lowered and swung to either side. All movements of the machine are direct motor movements, no clutches being required in the operation of this machine. At the present time the machines are loading approximately 500 tons per shift. The machine is operated by two men; one operating the main part and front of the machine, the other merely operating the stop switches on the rear, or loading conveyor. By means of four propelling motors, attached one to each of the axles, the machine is driven into the coal up to the slipping point of the wheels. The rotary motion of the dipper, which is located at the front, rolls the coal back into the first conveyor. The machine has sufficient power to enable it to shake down and lower any shots which may be standing and not properly rolled out. Although the machine operator is located some 20 ft. from the face, and presumably out of the way of any dangers of bad roof, the machines are stopped occasionally in order to permit the operator to test the roof.

Duplex motor drive on 54-in. 1,750-ft. belt conveyor from mine. Motor at left 225 hp. At right, 75 hp. adjusted to automatically operate at different speeds taking care of belt stretch.

In all of these operations at the face,

as well as all operations throughout the mine and top plant, each section foreman, machine operator, repair man, assistant foreman, or any man being responsible for any operation, is required to keep a daily log of the operation of his machine or the work which he has performed. At two-hour intervals the performance of each section is phoned to the despatcher, who relays this information on to the main office. In this manner a constant contact is established between the operating officials and the men working at the face, and difficulties of various kinds may be detected and removed immediately. In addition to these reports, time studies are constantly being made of all operations and all machines. These studies are even kept on the track-laying crews, and detailed reports are made each day as the result of these time studies. These reports and studies are very carefully analyzed in order that corrections may be made of any faulty practice developed. We feel that these time studies together with the reports of the various units are of very great value and importance to us, and we attribute to these a great portion of any success we may have had in the operation of our mechanical mine.

Transportation System

We have found in the operation of the loading machines that a comparatively small percentage of its time is actually spent in loading coal. Our main problem is one of transportation and removing the coal from the machine. In order to facilitate this an elaborate system of dispatching has been devised which is functioning very efficiently at the present time. Gathering is done by means of eight-ton battery locomotives and eight-ton combination trolley and cable reel locomotives equipped with explosion proof motors and control. Our haulage is kept separate, the loads being transported to the bottom on an entry equipped with 60-pound rail. It might be well to note here that in spite of the fact that we were designing a mechanical mine, we were very fortunate in being able to locate out mine opening at such a point that we were able to take advantage of grades in favor of the loads, and natural drainage in the mining of approximately 70 percent of our available tonnage. The empty track is entirely separate from the load track and is equipped with 40-pound rail. Manganese switches and frogs are used at all main junction points and 6-0 trolley wires with the latest type hangar and switching equipment.

Power at the Face

In mechanical mining such as we are doing we have found that our power load is very highly concentrated in the working sections of the mine. For this reason we have developed in connection with the General Electric Company 300-kw. portable motor generator sets in furnishing power to the working faces in the different sections. These sets receive their power through submarine armoured cable which is buried in the bottom in a trench cut beside the track. This trench has been cut with the cutting machines, the cutter bar being turned to the shearing position and the machine trammed along the track cutting the trench as it goes. The sets are housed in cross cuts in the various sections of the mine and are placed in portable houses built of steel and transite. Power from these sets is fed to the working face in the ordinary method. These sets are built with motor generator set mounted on the one truck, the a. c. panel on another, and the d. c. panel on a third so that they may be disconnected, moved to a new location, and operating again in less than a shift. These have been of great service to us in maintaining uniform and high voltage at our various equipment and have reduced the number of break-downs and burn-outs due to low voltage to a very great extent.

The mine is thoroughly rock-dusted, using a high pressure, Government approved rock dusting machine which receives its power from one of the storage battery locomotives. At the bottom the coal is dumped by means of a rotary dump which is fully automatic with the exception of the start and stop. Dust from the rotary dump is drawn off through the bottom of the enclosure by means of a permissible blower which dispatches this dust through a pipe to the surface. The dumping chamber is equipped with curved side and discharge plate built in such a manner that as the car is turned over the coal slides into the bin rather than being thrown or dropped, thus reducing breakage. The rotary dump pauses for a few seconds in the vertical position in order to allow the car to clear, then accelerates and returns to normal position. The cars hold about 5½ tons machine loaded and are equipped with roller bearings, spring boxings, and spring swivel couplings. They are also built with a top section of 1 ft., being removable without destroying the car in case low coal is being mined. Cars are equipped with brakes operating on two wheels, although provision is made to add brakes to the other two wheels if found necessary. One man controls all operations at the dump and also the feeding apparatus from the storage bins to the belt. Ample provision on the bottom is made for the storage of loads and bins are also provided at the dump as a method of equalizing production with belt capacity.

A Major Feature

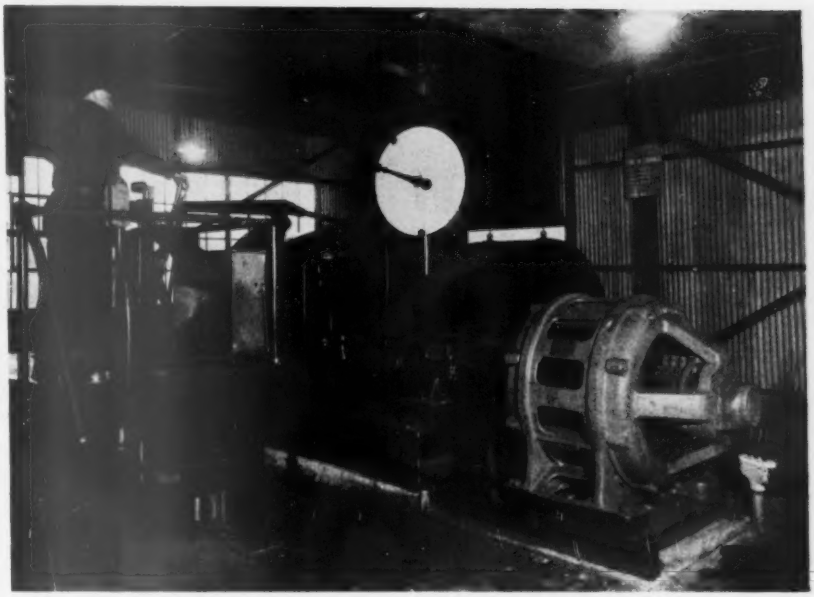
One main feature of the entire Wildwood plant are the provisions which have been made where the different operations merge into one another for the storage of coal which provides that in case of temporary stopping of any one operation the plant can still function in spite of the delay. Large storage bins for raw coal are provided between the tipple and the cleaning plant and other large bins for storage of cleaned coal are provided between the cleaning plant and the loading plant. On the bottom the cars are handled into and out of the rotary dump by an automatic car haul equipped with hydraulic brakes which operate in either direction. Provision is made to store either coal or slate at the bottom, a fly valve being used to throw the coal from the dump into either bin.

The conveyor belt is 54 in. wide, 12-ply, 36-oz. duck, rubber covered, and was shipped to the mine in two sections. Two ends were vulcanized together, the other two ends being fastened with a metal clamp. It was run this way for a considerable length of time until it was felt that approximately all of the stretch was out of the belt, and then the remaining two ends were vulcanized, making it an endless belt approximately 1,800 ft. long. The total lift from the belt feeders on the bottom to the discharge point on the tipple is 210 ft. The belt drive is located between the tipple and the mouth of the slope on the surface. It is a duplex drive, one motor rated 225 hp., the other 75 hp., and adjusted to automatically operate at different speeds, thus taking care of the belt stretch. This drive, as well as the majority of others throughout the plant, are of the Texrope type. The belt has a normal capacity of 750 tons per hour, although after operating it for some time we feel that it will safely handle at least 30 percent more than this. From the main belt the coal discharges onto the screens where it is separated into plus 4-in. lump and a minus 4-in., which is passed over to the cleaning plant. The 4-in. lump coal is passed over reciprocating picking tables where it is cleaned and inspected and then passes to the mixing conveyor, or the loading booms, and thence into the cars or retail coal bins.

Cleaning the Coal

The tipple is equipped with two large crushers capable of crushing all or any part of the mine production to any desired size. It is also equipped with mixing conveyors which enable all of the various sizes and coals of different analyses to be mixed in any proportion. The minus 4-in. is passed through the cleaning plant, in which are installed three Peale Davis Pneumo Gravity Air

Cleaning Tables which have a capacity of over 300 tons per hour. The raw coal goes over the first table which separates it into three parts: one being a very low ash and low sulphur product, another the intermediate, and the third the refuse. The intermediate coal is crushed and together with the refuse from the picking table is passed over the second table where a second cut is made. From this point the intermediates again travel on to the third table where a final rejection of the refuse is made. In cleaning the Freeport coal, where the difference in specific gravity between the coal and the boney is slight, we have found that the operation of the three tables gives us an even better result than is obtained from the passing of many other seams of coal over the ordinary installation of one or two tables. All motors in this plant are equipped with explosion proof collector rings as a safety precaution. The air is furnished by three large fans of the high torque full voltage starting synchronous type, which enables us to correct our high power factor. The air is operated in a closed circuit system, being re-circulated after the dust has been settled out and removed. The tables are approximately 65 ft. long and 14 ft. wide, weighing some 35 tons, and carrying a load of approximately 40 tons of coal. These tables are driven by two 30-hp. motors at a speed of 170 revolutions per minute at a stroke of 2¼ in. This cleaning plant is one of the principal operations of the Wildwood plant in that it is here that the coal is refined to meet the various specifications necessary to produce coal for the various purposes for which it is used. From the cleaning plant the coal travels over two belts to a system of storage bins in the main tipple. A screening plant is located over these storage bins and between the storage bins and the loading booms another battery of screens is located. These enable us to produce accurately sized coal in any of the numerous sizes which the present selective market demands. It is also possible through these bins to analyze the operation of the cleaning plant and the tipple and to furnish coal which will be uniform in analysis from day to day. In fact, it is possible to furnish a guaranteed analysis with any shipments which are made, as the sampling and analyzing of these samples is carried on in a very well equipped sampling room and laboratory. These operations are performed on a production basis, a definite routine being followed which enables us to keep a constant check on the product as it moves through the plant. Loading into cars is done by means of drag type loading booms which operate from the mixing conveyors extending throughout the entire cleaning plant and tipple. Coal of various sizes in different proportions and analyses is very readily and efficiently loaded.



Hoist used in removing and furnishing equipment and supplies to mine

Avoiding Delays

In providing shops, store room, and other facilities for properly maintaining the various equipment used at this plant, it was kept in mind that equipment would be in operation the greater portion of the time and that delays must not be tolerated. For this reason the shops are very completely equipped to handle all types of mechanical and electrical repairs. A large corps of specially trained electricians and mechanics make a special inspection of all equipment between shifts. Accurate records of parts and labor are kept together with detailed reports of all inspections which are made.

Accident Prevention

In our safety work we have been guided by the recommendations of the United States Bureau of Mines, American Mining Congress, and the State Department of Mines. All men are trained in first-aid work, and numerous crews are trained in mine rescue. A large assembly hall is equipped with a motion-picture machine and all facilities for the training of the men. Very complete first-aid and mine-rescue equipment is kept on hand immediately available at any time that it might be needed. Meetings of various groups of men are held during the day and evening during the week, when instructions on safe practices and efficient operation of the various types of equipment is given.

In the planning, development, and operation of Wildwood we have endeavored as much as possible to get away from the conception of a mine as being a number of various units and operations remotely related to each other. We, of course, emphasize the importance of each operation, but feel that more important is the relation of each operation to the one preceding and following, as an uninterrupted flow of our product must be maintained from the face through all of these operations to its ultimate destination in the railroad car.

After several years of planning, ground was broken on July 5, 1928, the first coal removed the latter part of December, 1928, and at the present time the full plant is functioning. We feel that we have initiated a system of mining and refining of coal which will meet the specifications of the various plants and processes where coal is used, and that a product accurate in size and uniform in quality can be delivered at all times.

In speaking of those who have been responsible for the mine, I feel that special mention should be made of the services of Mr. T. W. Phillips, chairman of the board; Mr. C. F. Hosford, president; Mr. R. E. Sprenkle, secretary and treasurer; and Mr. E. J. Weimer, superintendent; and in the Allen and Garcia organization, Mr. J. H. Fletcher and Mr. Harry Hibley; and of the Westinghouse Electric and Manufacturing Co. organization, Mr. W. D. Turnbull and Mr. Paul Jordan; all of whom, together with many others, have given unsparingly of their time, thought, and labor toward the development and operation of the Wildwood plant.

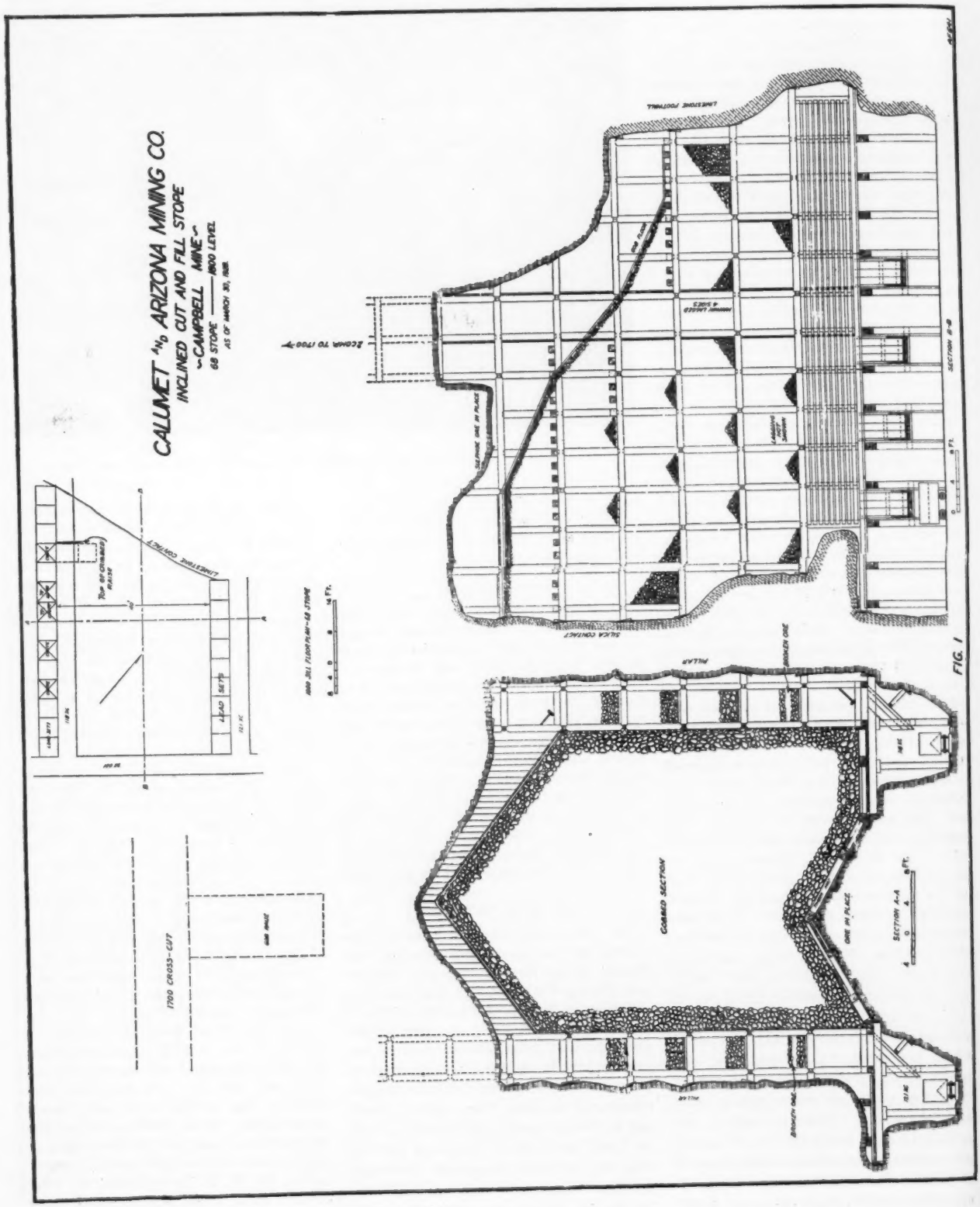

CALUMET & ARIZONA MINING CO.
INCLINED CUT AND FILL STOPE
~CAMPBELL MINE~
68 STOPE —— 1800 LEVEL
AS OF MARCH 30, 1928
LIMESTONE FOOTWALL
SULFIDE CONTACT
SECTION A-A
LIMESTONE CONTACT
1700 CROSS-CUT
CORED SECTION
PILLAR
BROKEN ORE
SECTION A-A
ORE IN PLACE

FIG. 1

METALS

GUY N. BJORGE
Editor

Practical Operating Problems of the Metal Mining Industry

Inclined Cut and Fill *and* Semi-Shrinkage

Methods of mining employed at the Campbell Mine of the Calumet and Arizona Mining Company, Warren, Arizona

By H. M. Lavender *

Physical Characteristics of the Ores and Enclosing Rocks

In the Warren District as a whole the ore shows a marked variation in physical characteristics, varying from the soft oxide and porphyry ores to the exceedingly dense and silicious sulphides. As the stoping methods treated in this paper deal only with those in use in the Campbell Area, the discussion will be confined to the occurrences of that locality.

The ore body as developed on the 1,600, 1,700, and 1,800-ft. levels averages about 500 ft. in length and varies in width from 50 ft. to 250 ft.

The footwall contact is fairly well defined, with the exception of fracture zones which have caused some displacement. The dip shows a marked variation, varying from nearly 90 degrees to as flat as 25 degrees. Above the 1,700 level the footwall roughly conforms to the normal dip of the limestone beds of the district.

The hanging wall is subject to a greater degree of variation than the foot wall, varying from an economic silica-pyrite contact of low copper content to a sharply defined hanging wall conforming to the local bedding planes.

The greater portion of the ore consists of a mixture of pyrite, silica, and limestone as the gangue with chalcopyrite and bornite the main visible copper bearing minerals. Along the limestone contact and fracture zones are found native copper, cuprite, chalcocite, and other secondary minerals.

In comparison with the other extensive ore bodies of the company, the Campbell ore body, from a stoping standpoint, may be classified as a fairly homogeneous body of sulphide ore, of rather high silica content which lends itself readily to the requirements of the stoping methods now being used. The requirements may be briefly stated as:

(1.) The ability of the back to sustain itself with a minimum of support, when properly arched and trimmed over the area being mined.

(2.) The necessity of complete extraction in the section being mined.

(3.) Homogeneous deposit which reduces to a minimum any selective stoping in the section being mined.

(4.) As nearly as possible the prompt and complete filling of all stopes as sections are completed.

The hard character of the ore makes heavy blasting necessary in order to prevent excessive formation of boulders.

Stoping Methods

Inclined cut and fill

This type of stope may be classed in two general classes:

(1.) Double leads (a line of square sets along both sides of the section.)
  a. Fill raise in hanging wall.
  b. Fill raise in footwall.

(2.) Single lead and single cap.

Figure 1 shows a double lead set stope with the fill raise in the hanging wall. This class stope may be further classified as to the type of bottom, the inclined or rafter type being used in this case.

Figures 2, 3, and 4 show a double lead, flat bottom stope with the fill raise in the footwall.

Figures 5 and 6 show the single lead, single cap stope with the fill raise in the footwall. The single row of caps and posts is for holding the fill in place at the pillar line.

General Discussion

The inclined cut and fill stope dates back many years in mining history. Articles appearing during the eighties of the last century carry descriptive matter pertaining to the general idea. In the early years of the present century, application for patent was made on a method which embodied the same principles.

The first adoption of this method in the Calumet and Arizona Mining Company Bisbee Mines was about 1915, in the Junction Mine. Mr. Oscar Gilman was at that time general foreman of the Junction Mine and to the first stopes employing this type of mining was applied the name in local use for many years, namely: "Gilman Cut and Fill."

Finding this type of mining adapted to a large portion of the ore bodies of the Calumet and Arizona Bisbee Mines, its use has continued and today with many modifications is producing a large portion of the present tonnage.

In the Campbell Area, the cut and fill method together with a modification, namely, the semi-shrinkage, is exclusively used with the exception of one or two minor and unimportant stopes.

Preliminary Work

As previously explained in this article, the ore body was sectionalized into the various stope sections and pillars, subsequent development work conforming mainly to these established sections.

In general, the plan adopted was to have two adjoining stope sections, each from 45 to 50 ft. in width, separated by a pillar about 45 ft. in width from the next two stoping sections. *Figures 4-a and 7-a* show this general arrangement. Where the width of the ore body was not excessive, the stopes were to be mined from hanging wall to footwall. Where,

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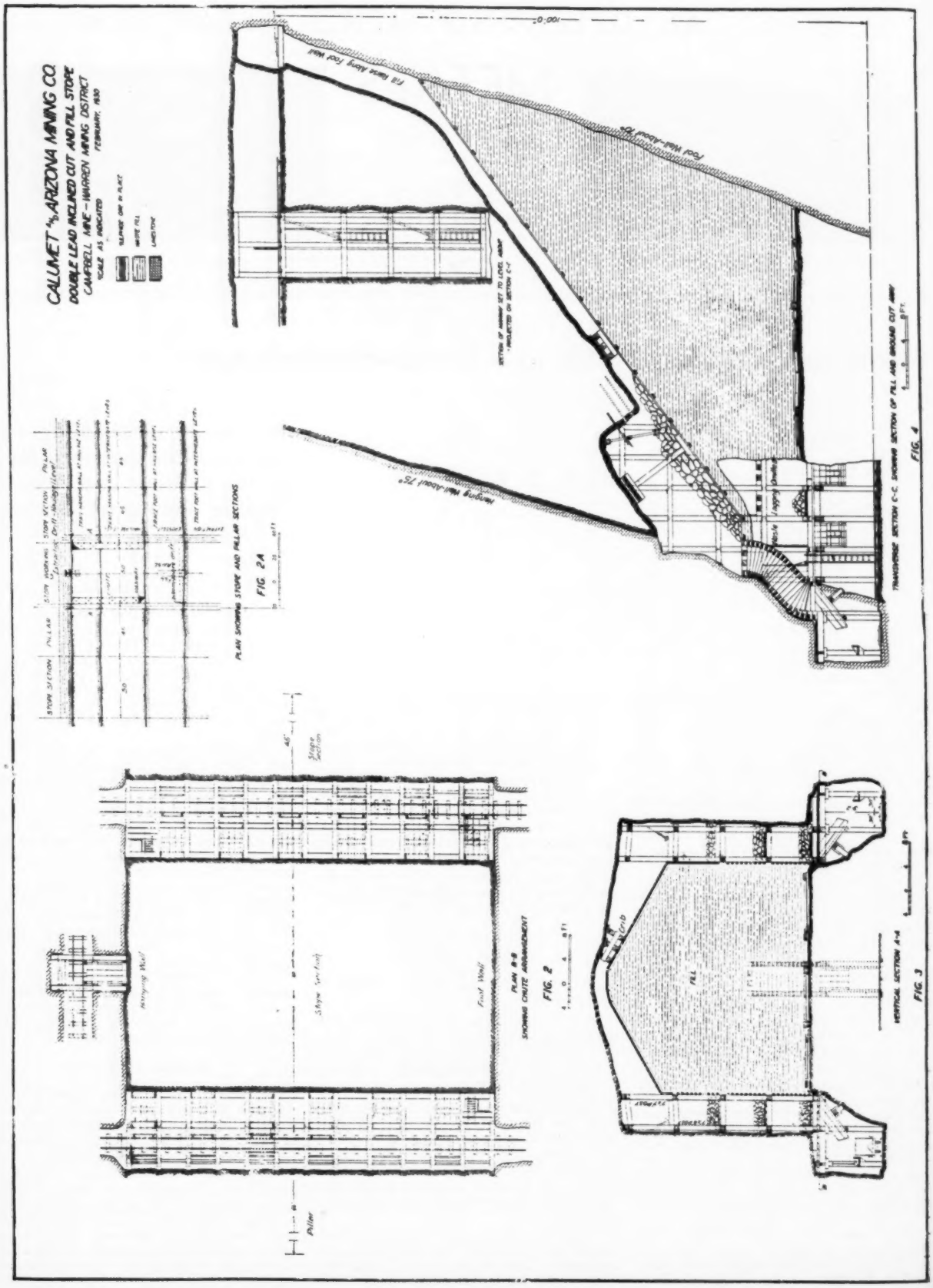
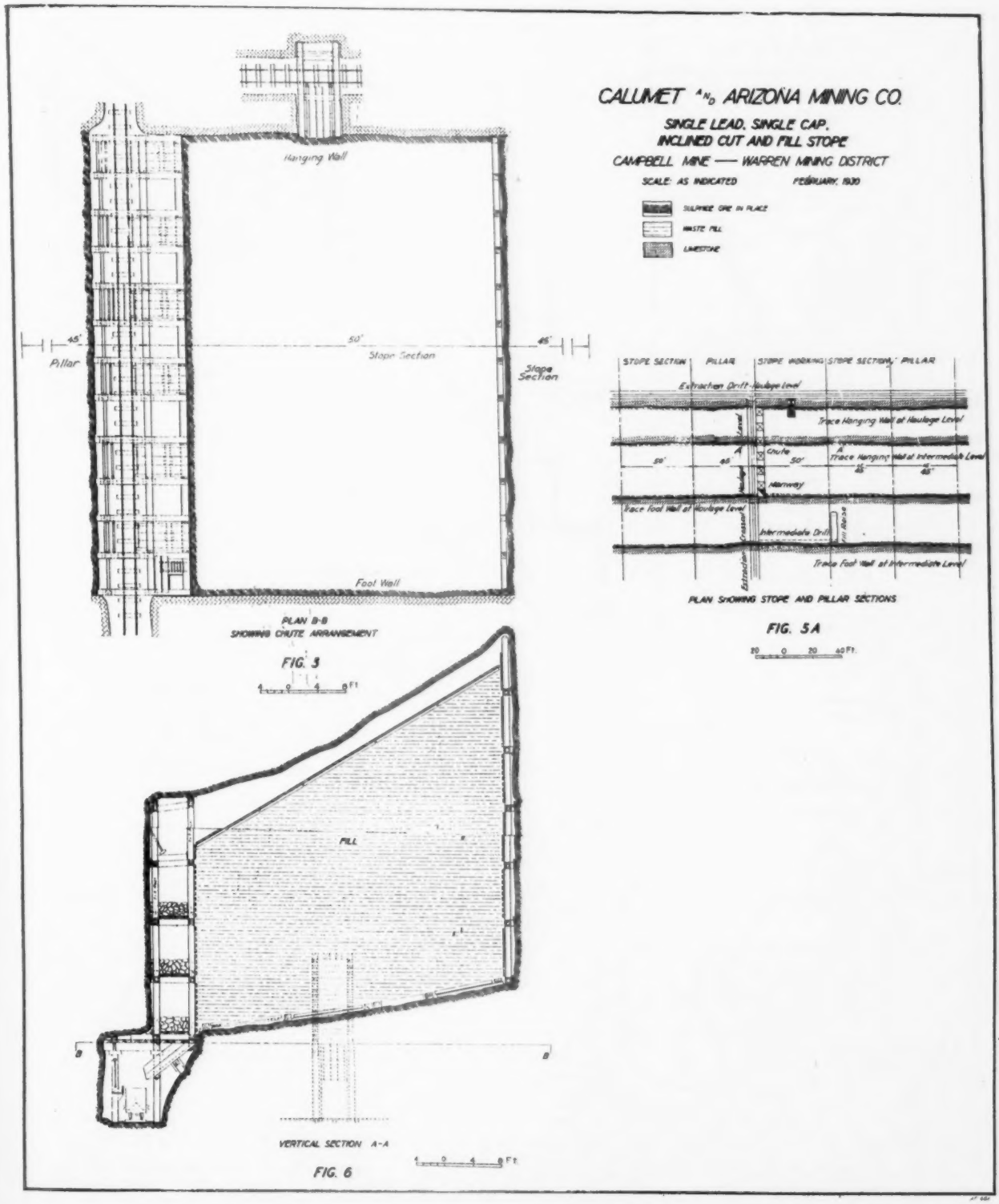

CALUMET & ARIZONA MINING CO
DOUBLE LEAD INCLINED CUT AND FILL STOPE
CAMPBELL MINE – WARREN MINING DISTRICT
SCALE AS INDICATED
FEBRUARY, 1930
ORE IN PLACE
WASTE FILL
LIMESTONE
FIG. 2A
PLAN SHOWING STOPE AND PILLAR SECTIONS
FIG. 2
PLAN SHOWING CHUTE ARRANGEMENT
FIG. 3
VERTICAL SECTION A-A
FIG. 4
TRANSVERSE SECTION C-C SHOWING SECTION OF FILL AND BROAD CUT ARM



as above the 1,600 level, the width of the ore body is greater, the sections are cut off by either a single cap or regular lead, and new sections established conforming to the established section lines.

In laying out the stope and pillar sections, it was planned to work both stope sections by cut and fill methods. The pillar was to be recovered by means of a Mitchell Slice running at right angles to the long stope dimensions. While work at the present time has not progressed to the point of mining the pillar sections, the success of the cut and fill method in this section has made it probable that a serious attempt will be made to use the cut and fill in mining the pillars.

In vertical extent, it was planned to take up each section in 200-ft. blocks where the continuity of ore permits; the interval chosen is the distance between haulage levels. Thus one series of stopes will be from the 2,200 level to the 2,000 level, another from the 2,000 level to the 1,800 level, and so on in similar blocks for the full vertical extent of the ore. Pillars are carried throughout the ore body in one vertical section.

In this method of stoping the waste demands for filling are subject to extreme

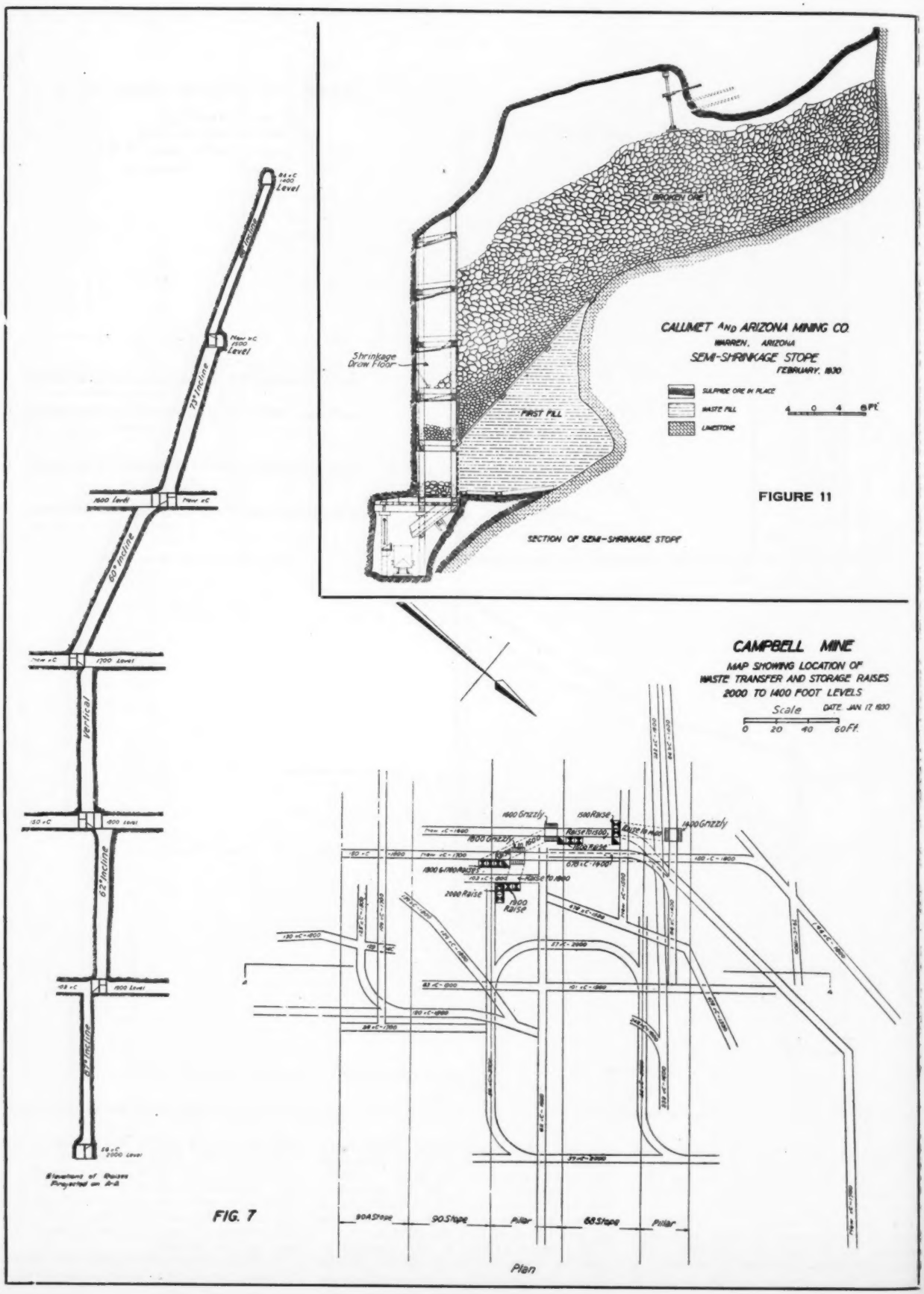


FIGURE 11

FIG. 7

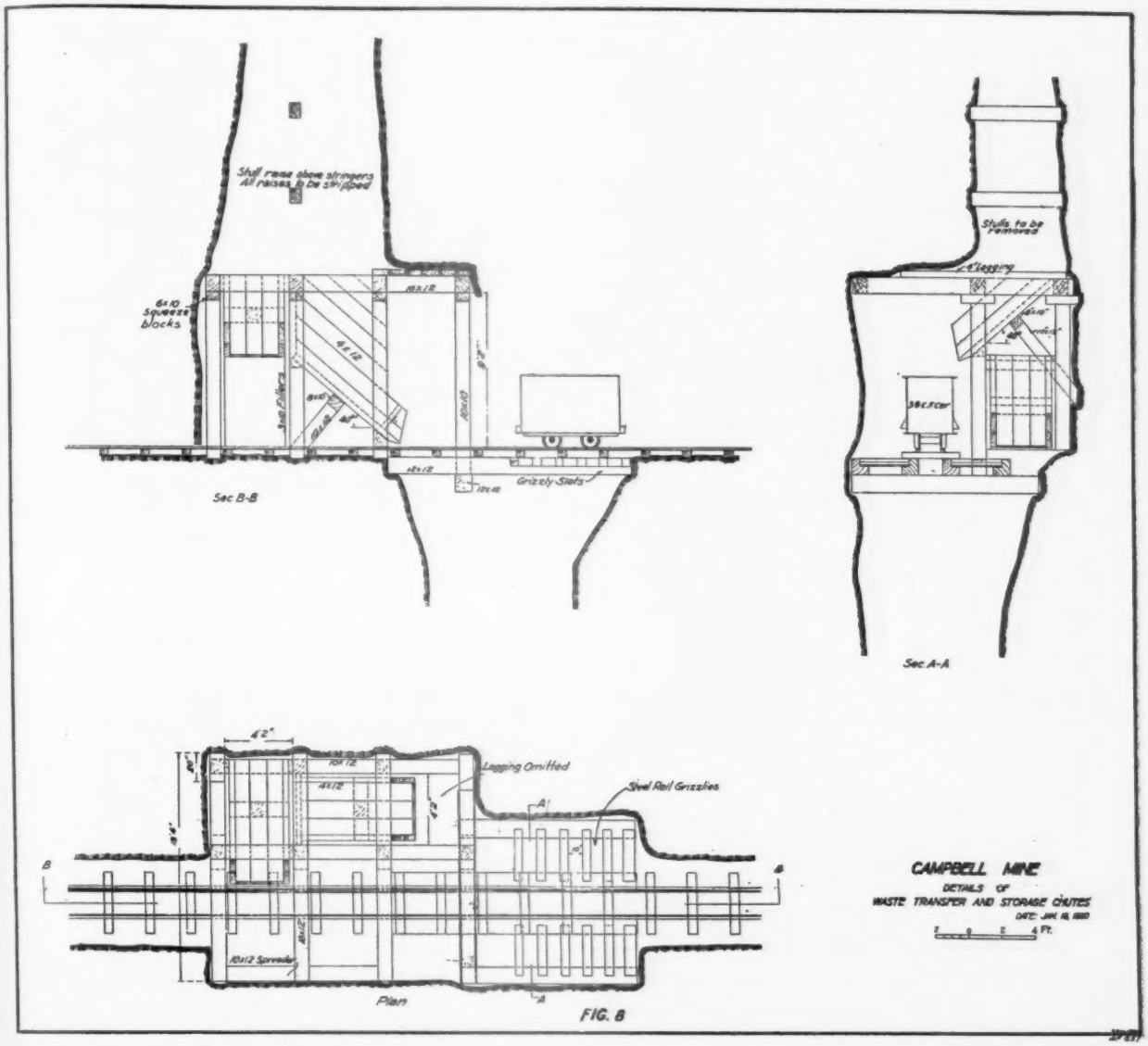


FIG. 8

variations. For this reason ample storage capacity is desirable which is provided for by a series of storage raises which directly or by means of a short transfer can in a brief time supply a large amount of waste to a given stope. *Figure 7* shows a system of waste storage raises which are planned to meet the conditions outlined above. *Figure 8* shows the construction details of the waste transfer and storage chutes. Waste is obtained from development headings. An attempt is made to balance the stoping and developing work. No waste is handled in the shaft except between levels from isolated areas.

At the present time all ore produced in the Campbell area is trammed to the Junction shaft for hoisting. Provision is made at the Campbell shaft for an ore pocket below the 2,200 level, which will be connected to a series of ore raises from the 1,800 level. The total capacity of both raises and pocket will be about 1,200 tons of sulphide ore.

Figure 9 shows the shaft loading station arrangement on the 2,200 level and *Figure 10* shows the general ore chute plan from the 2,200 level to the 1,800 level.

Stoping Details

Double lead sets.—In the illustrations shown (see *Figures 1 to 4*), crosscuts are driven in the pillar and adjoining stope sections along the section lines. The ground is then cut out for stringer sets.

Posts 9 ft. 2 in. in length are used, the face of the posts being 30 in. from the center line of track. The bottom end is sunk 6 in. below the rail elevation. Between the top of the posts and the stringers are placed 6 by 10-in. crush blocks. The stringers, which are 10 by 12-in. in section, average 13 ft. in length and are laid with the greater dimension vertical. This gives a distance of 9 ft. 2 in. from rail to stringer. The sets are 5 ft. apart center to center. After the stringers are placed, chutes are built in alternate sets and mining operations started above the stringers. Simultaneously with the cutting out for the lead sets, mining operations are started in the stope between the lead sets. In case of a flat bottom stope, the ore is allowed to pile up to form a natural slide toward each lead; the back of the first cut is shaped for the initial fill. Meanwhile, work on the fill raise has been pushed, the raise holing to the level above and frequently to the next haulage level, a vertical distance of 200 ft. The ore from this raise is worked to the chutes in either lead. On completion, the raise is stripped and serves for both fill and ventilation purposes. Since the natural angle of repose of the fill is approximately 37 degrees the back of the stope roughly follows that angle. The character of ground determines the height to which the initial cut is taken.

Simultaneously with these operations the placing of the lead sets is started along the stope boundary lines. Flooring 3 or 4 in. thick is placed over the stringers and sills are laid on these. The outside row of posts in each lead set conforms to the stope section line. This leaves the extraction crosscuts both in solid ground, with the weight of gob on the solid ground beneath, thus relieving the crosscuts of this weight and enabling them to be maintained with a minimum of repairs.

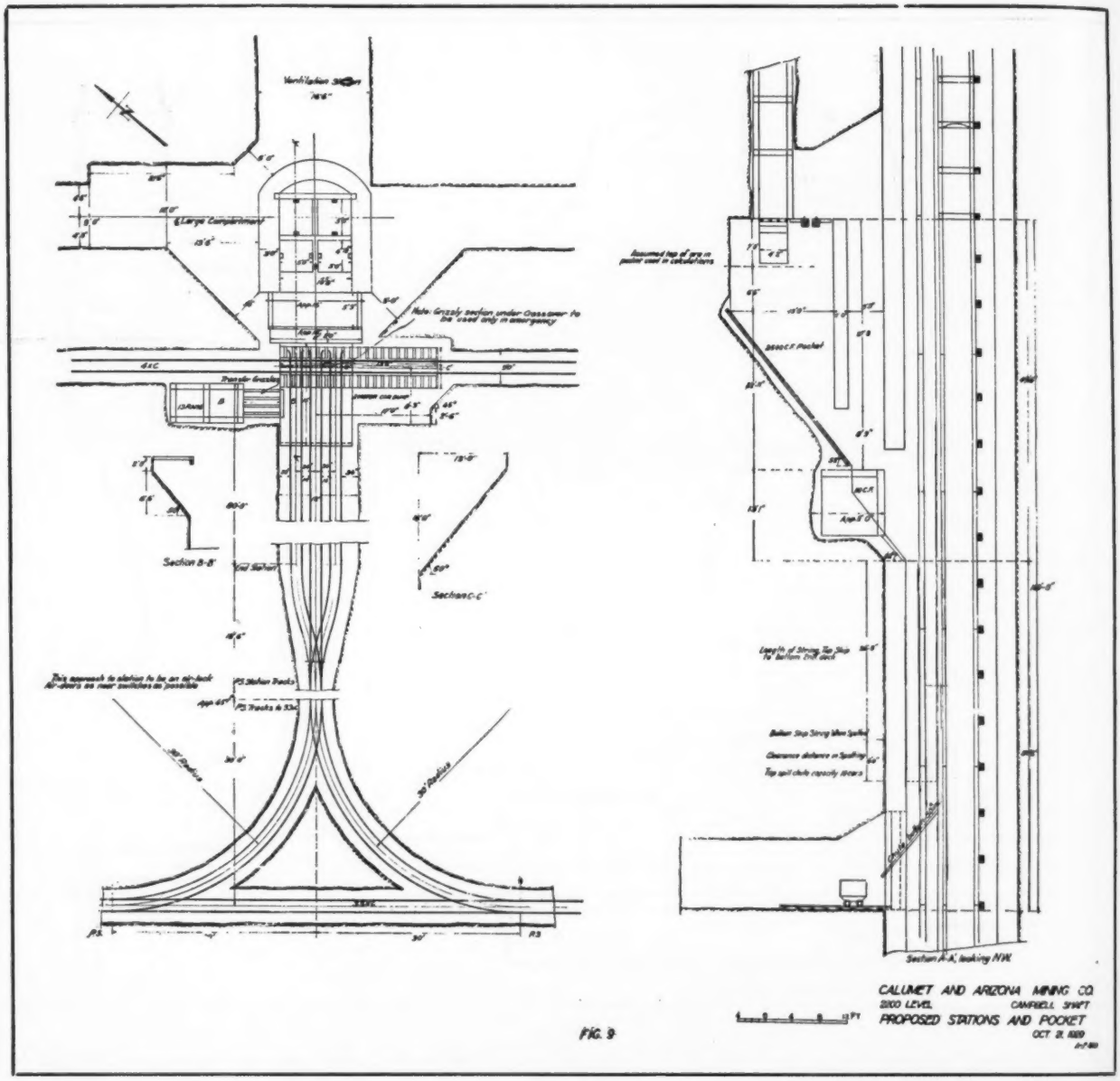


FIG. 9

Standard 10 by 10-in. posts 7 ft., 4 in. long are used in the outside of each row of leads. The posts of the inside row of fill side are of the same size but 7 ft., 7 in. in length. This difference of 3 in. is to allow for the compression in the timber on the fill side due to the settling of the fill, thus helping to maintain relatively level floors.

The leads are carried sufficiently in advance of the fill to provide ample height for gob lagging and also to give access to the working floor for the succeeding cut. A manway set is usually carried in each row of leads.

On completion of the lead sets and the section between leads, the stope is cleaned out, hand mucking and drag scrapers being used. The bottom of the stope is then covered with a timber mat, which is sometimes laid on sills placed for the purpose. The mat consists largely of scrap timber gathered in the near vicinity.

The lead sets are lagged off on the fill side with either split lagging spaced from 3 to 4 in. apart or with 2 by 12-in. planks, 10 ft. long, laid edge to edge. In the case of split lagging care is taken to have the outer grain of the lagging placed on the side away from the fill. The apparent advantage of the solid lagging is in the tendency of the gob in settling to slide along the smooth surface, thus avoiding a part of the compression on the fill side of the lead sets.

Waste is then dropped through the fill raise until it is within 2 to 3 ft. of the back of the stope. In as far as possible further handling of the fill is avoided, the transverse angle of repose roughly approaching 37 degrees. A small amount of flattening of the cone on the sides towards the lead sets is necessary.

On the completion of fill, 2 by 10-in. sills are laid flush with the fill; 2 by 10-in. or 2 by 12-in. flooring, 10-ft. long, is then placed on these. Care is taken to avoid hollow places between flooring and fill. Flooring operations are usually started about 10 ft. up the slope above the lower edge of the fill and continued to the top. The spill of waste from these operations rolls to the bottom and is covered in flooring the last section.

If any loose or blocky conditions of the back have developed which cannot be corrected by barring down, small cribbed bulkheads may be erected for support.

Before mining operations are started, grizzlies of 10 by 10-in. timber spaced 10 in. apart are placed in the lead sets at the intersection of the fill floor line and the lead sets. With the filling of subsequent cuts and the raising of lead sets, these grizzlies, unless badly worn, are moved to the new grizzly floor above. In the event of excessive wear they are frequently left in place and the openings closed by means of other similarly worn grizzlies. This then forms a checker board and prevents the cutting out of lead set timbers and protects the chutes through checking the unrestricted fall of the ore from grizzly floors above. Flooring 4 in. thick is also

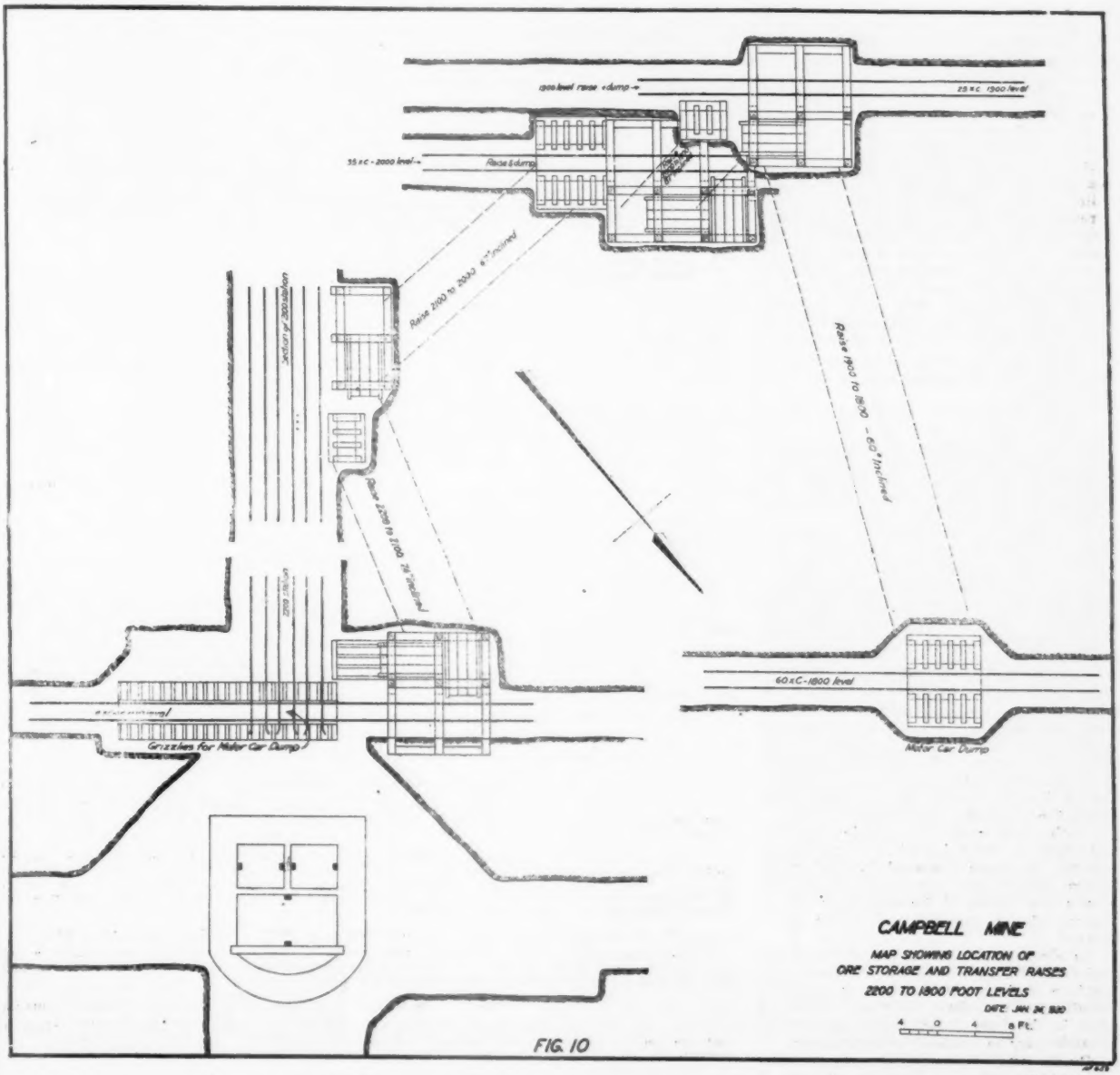

1900 level raise ‹dump›
25 x c. 1900 level
35 x c - 2000 level
Raise 2100 to 2000 - 60° Inclined
Raise 1900 to 1800 - 60° Inclined
Grizzlies for Motor Car Dump
60 x C - 1800 level
Motor Car Dump
CAMPBELL MINE
MAP SHOWING LOCATION OF
ORE STORAGE AND TRANSFER RAISES
2200 TO 1800 FOOT LEVELS
DATE JAN 24 1930
4 0 4 8 Ft.

FIG. 10

used to the same end. *Figure 1* shows this feature.

With the completion of the flooring, mining operations are resumed. A cut is started at the bottom and broken ore drawn off as produced. The average height of cut is about 12 ft. Sufficient ore is left undrawn to permit the back to be reached for both barring down and mining purposes. This also protects the floor while blasting and prevents undue breakage of floor boards. If bad ground develops the new back may be supported by means of an umbrella stull as shown in *Figure 4*.

After a cut is completed and the ore drawn into the chutes, the floor is taken up. In making the final cleanup before pulling the floors an especial effort is made to thoroughly clean the section. The last operation being to sweep the floor with heavy brooms, by which a considerable quantity of fine containing a high copper content is obtained.

Each cycle of cut and fill is approximately the same; the lead sets are raised with the main cut.

For stoping purposes drifter type machines are largely used, 7 to 8-ft. holes being drilled. The use of this type of machine is advantageous as the back can be readily shaped by drilling holes parallel to the floor angle. Also, the drifter is very successful in drilling in the generally hard ground encountered in stopes of this class.

A limited number of stopers, both hand-rotated and self-rotated, are used, principally in driving for lead sets and in raises. Pluggers are used for plugging boulders. In so far as possible this work is done on the mining floor, although when necessary plugging is also done on the grizzlies.

In blasting operations No. 8 detonators, safety fuse, and 60 percent strength gelatin dynamite are mostly used. Along some limestone contacts where the softer oxide ores occur 40 percent gelatin may be used. Main blasting operations are permitted only at the end of the shift. A limited amount of boulders may be blasted at the noon or supper hour.

At times, in order to avoid the necessity of mucking in flat places, a cribbed raise is brought up from the hanging wall end. Either 6 or 10-in. cribbing may be used, depending upon the height to which it is expected to carry the raise.

A chute and manway set may also be carried to the level above from one of the lead sets. This serves as a travel, ventilation, and supply raise.

In the stope shown in *Figure 1* the fill raise was started on the hanging wall and one of the crosscuts is inside the stope section. This was one of the earliest stopes started and was made to conform with then-existing raises and crosscuts. Otherwise the procedure followed is exactly the same as outlined in the previous discussion. As will be noted the floor in this stope is of the rafter type. The purpose of this is two-fold. First, to avoid excessive mucking on the first cut due to a flat place in the bottom of the stope. Second, additional head room is

available beneath the flooring for driving a crosscut to serve as a supply and ventilation outlet for the section below when mining up to this level.

In *Figures 5 and 6* is shown a single lead, single cap stope with bottom slightly inclined from lead set to single cap. As will be noted in *Figure 5-a*, the position of the footwall raise has been moved to a position outside the stope boundary line. It is planned to have the one fill raise serve both sections. The necessity for two extraction drifts is also obviated and in addition a single row of caps and posts replaces a double row. It is also considered that better filling of the stope may be obtained with less attendant shrinkage of the fill, thus improving mining conditions in the adjacent sections.

With the exceptions noted, the work is carried on in the same cycle as previously described.

Semi-shrinkage stoping.—In this method as used in the Bisbee Mines of the Calumet and Arizona Mining Company, the ground requirements are similar to those of the cut and fill methods, with the possible exception that back conditions must be uniformly good.

Figure 11 is a drawing of a stope using this method in actual operation. The stope is bounded on one side by a fault, on another by a lead set, a single cap forms the third side and the footwall forms the bottom of the stope. The footwall contact represents roughly the normal bedding of the limestone at that point.

In starting operations and to the completion of the flooring of the first fill, the procedure is the same as for the cut and fill stoping. On completion of the first cut, mining operations are started as before, but instead of one 12-ft. cut successive cuts are taken, the excess ore being drawn off and the lead sets raised with the progress of mining.

Both lead sets and single cap are anchored to the adjacent solid ground by means of cables fastened to anchors in holes drilled into the solid. This prevents any tilting of the sets after the removal of the ore and before the fill is placed.

In blasting the general practice of the cut and fill stopes is followed with the exception that particular care is taken in blasting all boulders after each blast, so that in the final draw, chute and grizzly trouble may be reduced to a minimum.

By the semi-shrinkage stoping methods a large reduction in flooring expense is made, some cuts having reached a height of 40 ft. above the fill floor before being drawn. A considerable breakage of flooring results from the blasting in stopes. Although a large percentage of the cracked and broken floor boards may be used for lagging and the remainder for timber mats, this breakage represents a distinct loss in all cuts. By eliminating the number of floors laid which is one feature of the semi-shrinkage method, a saving is made not only in the labor incidental to this work, but also in the material itself.

Although grizzly floors are carried up with the advance of the lead sets, they are only used for the ore derived from the advance of the lead. As is shown in *Figure 11*, the excess is drawn off on the grizzly floor one set above the intersection with the fill. This prevents any movement of broken ore along the floor and thus reduces wear on the boards.

Above the grizzly floor the 3-in. lagging is placed vertically, thus eliminating the tendency to remove additional lagging in order to temporarily facilitate drawing operations.

Before the final ore drawing operations are started in a stope, the back is closely inspected and very carefully barred down. If minor cracks have developed which may cause any weakness of the back the affected area is supported by a bridge consisting of timbers fastened by anchors in holes drilled into the solid back on each side of the place in question.

DIRECT CHARGES—CALUMET AND ARIZONA MINING COMPANY, BISBEE MINES

68 stope, 1,800 level. (Figure 3.)

Double lead, inclined cut and fill, rafter type bottom.
Period mine: May, 1926, to January 1, 1930.
Height mined: 170 ft. at the high end.

	Labor	Explosives	Timber	Air	Total	Tons ore
	$32,065.38	$6,999.45	$8,027.57	$11,234.42	$58,326.82	51,970
Cost per ton	$0.62	$0.135	$0.155	$0.215	$1.125	
Percent of cost	55	12	14	19	100.0	

90 stope, 1,800 level. (Figures 7 and 8.)

Single lead, single cap, inclined cut and fill.
Period mined: January 1, 1928, to January 1, 1930.
Height mined: 80 ft. at the high end.

	Labor	Explosives	Timber	Air	Total	Tons ore
	$14,582.12	$2,094.67	$2,771.88	$4,213.90	$23,662.57	20,894.0
Cost per ton	$0.70	$0.10	$0.13	$0.20	$1.13	
Percent of cost	62	9	11.5	17.5	100.0	

442 stope, 1,600 level. (Figure 13.)

Single lead, single cap, semi-shrinkage.
Period mined: June, 1928, to January 1, 1930.
Height mined: 80 ft. at the high end.

(a) First cut and fill section.

	Labor	Explosives	Timber	Air	Total	Tons ore
	$3,322.69	$813.87	$1,058.05	$1,434.00	$6,628.61	4,094.0
Cost per ton	$0.81	$0.20	$0.26	$0.35	$1.62	
Percent of cost	50	12	16	22	100.0	

(b) Shrinkage section. (Ore drawn in shrinking.)

	Labor	Explosives	Timber	Air	Total	Tons ore
	$8,663.32	$2,326.39	$2,413.98	$4,000.95	$17,404.64	8,198.0
Cost per ton	$0.106	$0.28	$0.30	$0.49	$2.13	

(c) Estimated cost of pulling broken ore in stope. (Based on previous shrinks.)

	Labor	Explosives	Timber	Air	Total	Tons ore
Cost per ton	$0.255	$0.035	$0.05	$0.015	$0.31	

All Stopes

(a) Campbell Area—Two-year period. January 1, 1928, to January 1, 1930.

	Labor	Explosives	Timber	Air	Total	Tons ore
	$214,567.57	$33,350.70	$50,025.15	$62,052.60	$359,996.02	280,527.0
Cost per ton	$0.765	$0.12	$0.175	$0.22	$1.28	
Percent of cost	60	9.5	13.5	17	100.0	

(The cost shown here represents the entire production of the Campbell area during the two-year period from January 1, 1928, to January 1, 1930. During that time a large number of stopes were started or were in the initial stage. This higher proportional expense, together with ore now tied up in shrinkage operations, is directly reflected in the costs. The stoping in this area is almost exclusively inclined cut and fill and semi-shrinkage.)

(b) Upper Junction mine costs. Two-year period. January 1, 1928, to January 1, 1930.

(The ground is not as hard as the Campbell and Lower Junction areas; sections are smaller and a considerable part of the stoping is in finishing out sections in old ore bodies. Square set, cut and fill, and Mitchell slice methods are all worked in this section.)

	Labor	Explosives	Timber	Air	Total	Tons ore
	$420,073.34	$38,947.32	$117,491.51	$60,205.60	$636,717.77	427,571.0
Cost per ton	$0.98	$0.095	$0.275	$0.14	$1.49	
Percent of cost	65.5	6.5	18.5	9.5	100.0	

(c) Lower Junction and Campbell mine costs.
Two-year period—January 1, 1928, to January 1, 1930.

	Labor	Explosives	Timber	Air	Total	Tons ore
	$474,016.34	$58,186.24	$105,667.91	$104,779.00	$742,649.49	605,540.0
Cost per ton	$0.785	$0.095	$0.175	$0.175	$1.23	
Percent of cost	64	7.5	14.25	14.25	100.0	

(Generally hard ground. Almost exclusively cut and fill and semi-shrinkage.)

(d) Junction and Campbell Areas combined.

	Labor	Explosives	Timber	Air	Total	Tons ore
	$894,089.68	$97,133.56	$223,159.42	$164,984.60	$1,379,367.26	1,033,111
Cost per ton	$0.865	$0.095	$0.215	$0.16	$1.335	
Percent of cost	65	7	16	12	100.0	

NOTE: The labor charge also includes bonus. The charge for explosives includes powder, caps, and fuse. The air charge includes: (1) Cost of compression; (2) air and water lines, hose and connections; (3) drilling machines and repairs.

Percent Extraction

In the Campbell Area, complete recovery is attempted. A slight loss of fines results through the cracks in the flooring, but by careful cleaning up and sweeping an attempt is (*Continued on page* 489)

Cates Succeeds Douglas as Phelps Dodge Head—Merger With Calumet & Arizona Indicated

Coincident with an announcement that joint engineering examinations are being made of the Phelps Dodge Corporations and Calumet & Arizona Mining Company properties with a view of ascertaining what, if any, mutual advantages would be derived by a closer relationship between them is the news that Louis S. Cates is resigning as vice president and general manager of the Utah Copper Company to accept the presidency of the

Walter Douglas, the retiring president of the Phelps Dodge Corporation

Phelps Dodge Corporation, succeeding Walter Douglas.

Phelps Dodge and Calumet & Arizona are already associated through joint ownership with the Nichols Copper Company of the El Paso refinery. Both companies have a large stock interest in Nichols Copper, and the three companies jointly control the Phelps Dodge Sales Corporation, the marketing agency for their products. Phelps Dodge has total assets of more than $242,000,000 and a copper production of more than 222,000,000 pounds annually. Calumet & Arizona has assets of more than $83,000,000.

Phelps Dodge was founded more than 115 years ago as Phelps & Peck, the principal business being exporting cotton and importing metals. In 1908 the Copper Queen Consolidated Mining Company was acquired, and in 1917 the name Phelps Dodge Corporation was adopted. Phelps Dodge stock has always been closely held by the Phelps, Dodge, James and Douglas families, who for generations have been associated with the enterprise. British interests holding stock in the company last year sold their holdings to a group of New York bankers who made a public offering of 200,000 shares.

Calumet & Arizona Mining Company was formed in 1901, and last April the company absorbed the New Cornelia Copper Company. In addition to New Cornelia it controls Verde Central Mines.

Mr. Cates, who takes up his new duties on May 1, has been connected with the mining industry since his graduation from the Massachusetts Institute of Technology in 1902, his first mining work being done in Mexico. In 1903 he was made assistant to the president of the National Sheet & Wire Company in New York, but went West again in 1904 to take charge of construction and development at Bingham Canyon, Utah, for the Boston Consolidated Mining Company, being made general manager in 1909. In 1910 Mr. Cates was made general manager of the Ray Consolidated Copper Company properties in Arizona, a position which he held until 1922 when he became vice president and general manager of the Utah Copper Company. He was president of the American Mining Congress in 1925, and now serves as a director.

Mr. Douglas first connected with the mining industry of Arizona in 1890 when he became an engineer for the Commercial Mining Company at Prescott. In 1892 he was associated with the Consolidated Kansas City Smelting & Refining Company as metallurgist, but returned to Arizona in 1894 as a chemist for the Copper Queen Consolidated Copper Company. Subsequently, he spent two years with the Detroit Copper Mining Company, now the Morenci Branch of Phelps Dodge. In 1899 he was made superintendent of the Copper Queen Consolidated Company and general manager in 1902. Mr. Douglas was appointed general manager of Phelps Dodge in 1910 and in 1913 he succeeded his father, Dr. James S. Douglas, as president of the Phelps Dodge Corporation. Since that time he has been directing head of the corporation and its allied companies. Mr. Douglas is also a former president of The American Mining Congress.

Mr. Douglas continues as a director of Phelps Dodge. "For some time I

Louis S. Cates,
The new Phelps Dodge head

have been desirous of being relieved of active responsibility and direction of the affairs of the company," said Mr. Douglas. "It has been a great satisfaction, therefore, for me to be able now to announce that we have one of the outstanding men in the industry to be my successor."

D. D. Moffat will succeed Mr. Cates as vice president and general manager of Utah Copper. He now holds the position of assistant general manager.

Starting off as assayer at the Ontario mine at Park City, Utah, Mr. Moffat held various positions in Montana, Wyoming, and Utah, until in 1908, when he became general foreman of the Boston mill at what is now known as Arthur. In 1910, when Boston Consolidated was acquired by Utah Copper, Mr. Moffat became assistant superintendent of the Arthur plant. Three years later, he went to Hayden, Ariz., as plant superintendent of the Ray Consolidated Copper Company, remaining there for six years until he was brought back to Salt Lake to become consulting metallurgical engineer

for all the Jackling plants. In July, 1923, he was made assistant to general manager of Utah Copper and on January 1, 1926, assistant general manager.

Allen Heads Lake Superior Iron Ore Association

R. C. Allen, vice president of Oglebay, Norton & Company, was elected president of the Lake Superior Iron Ore Association at a meeting held in Cleveland, April 5, succeeding Col. F. B. Richards, resigned. S. Livingston Mather, vice president of The Cleveland-Cliffs Iron Company, was elected vice president, filling the position made vacant by Mr. Allen's election to the presidency.

In addition to the election of officers there were also several amendments to the constitution and by-laws made, most important of which was one providing for a board of directors. The board's duties have in the past been performed by an executive committee, which is still retained.

The board consists of: R. C. Allen, H. G. Dalton, of Pickands-Mather Company; S. L. Mather, George M. Humphrey, of the M. A. Hanna Company; Donald B. Gilles, of the Corrigan-McKinney Steel Company; Patrick Butler, of Butler Brothers; A. B. Sheppard, of the Jones & McLaughlin Steel Corporation; William P. Snyder, Jr., of the Shenango Furnace Company, and Clarence B. Randall, of the Inland Steel Company.

The executive committee is composed of Messrs. Allen, Dalton. Mather, Humphrey, and Gilles. Other officers elected were: Mr. Dalton, vice president; H. S. Stebbins, treasurer; W. L. Tinker, secretary; R. C. Farquhar, assistant treasurer, and Hazel M. Ronk, assistant secretary.

Jackling Establishes Fund at Missouri School of Mines

Funds for the purpose of education in the sciences and arts pertaining to the mineral industry have been provided at the School of Mines of the University of Missouri, at Rolla, Mo., through the establishment of the Jackling Foundation by Daniel C. Jackling, president of the Utah Copper Company. The purpose of the foundation, which is expected to eventually total $600,000 through contributions already made and to be made by Mr. Jackling, is to aid worthy students through school by means of loans and to provide scholarships and special educational features not ordinarily provided for at state schools. About 20 years ago Mr. Jackling, who is a graduate of the class of 1892, established the Jackling Loan Fund at the School of Mines, which has helped over 300 students through school.

ZINC INSTITUTE MAKES PLANS FOR RESEARCH AT ANNUAL MEETING—ROOSEVELT REELECTED

With steps taken toward the establishment of efficient research work, investigation of the needs and value of zinc for various purposes, and the creation of demands made of zinc to put the industry on a safer and more profitable basis, the American Zinc Institute concluded a successful three-day session at St. Louis, its twelfth annual meeting, held April 14, 15, and 16.

Various efforts in behalf of research work was crystallized in a reseolution

Ralph M. Roosevelt, president of the Eagle-Picher Lead Company, reelected president of the Institute

adopted by the board of directors, instructing the executive committee to work out some plan of research and to spend such money deemed necessary to get the plan in progress.

At the first day's session, given over mostly to committee reports and general business, President R. M. Roosevelt, reporting for the executive committee, said that for the first time the western miners were contributing to the support of the Institute and that both the miners and smelters in other sections of the country were meeting their obligations, as outlined in the last financial plan adopted.

Reporting for the zinc research organization committee, Theodore Marvin stated that some progress had been made, but that a greater amount of headway could have been made.

President Roosevelt expressed some disappointment regarding the research program. Only seven companies in the United States had approved the plan submitted at the last annual meeting and adopted by the board of directors, he said. It was evident that some means of modifying the program would have to be made, he added, before much could be accomplished. Although not stated, it was inferred that the producers of zinc in the Tri-State district and the consumers of those concentrates would have to make a separate effort to broaden the market for prime western grades of metal, which is the grade of metal produced from Tri-State concentrates.

It was indicated that the producers of high grade zinc were carrying on a research program of their own and did not feel like contributing to a program which would stimulate the use of a metal which they did not produce.

A 20 percent increase in the membership was reported by Charles A. Neal of the membership committee. The committee had worked out the membership question in the Tri-State section and had added a number of new members. C. F. Dike read the report of John Robinson, of the Tri-State Zinc Ore Producers' Association committee, in which it was stated that the Joplin operators were lending more aid to the Institute than ever before.

J. D. Conover reported on the accomplishments of the tariff committee. President Roosevelt, in commenting on the report, said that the tariff committee had done something that everyone said was impossible, and was high in his praise of the work done along this line by Secretary Conover.

Fred N. Nesbitt, safety engineer of the Tri-State Zinc and Lead Ore Producers' Association and chairman of the accident prevention committee, suggested that the members of the institute join in the work of the national safety council as the best means of reducing accidents in mines and smelters.

Dr. Hugh B. Baker, manager of the trade association department of the U. S. Department of Commerce, opened the afternoon session by an address on "What the Institute Should Mean to Its Members."

The first day's session was concluded by the annual smoker.

The importance of research work to find more uses for zinc and increase the demands for the products of the zinc mines, was the keynote of the second day's meeting.

"Zinc in Die-Casting" was the subject of a paper read by Robert M. Curts of the technical service division of the New Jersey Zinc Company. He explained the methods of die-casting with various alloys, composed of zinc and other metals, illustrating his talk with zinc dies of many shapes. He showed the advantages of artistic designs in die-casting for many articles in common use, and, the great possibilities for zinc in this connection.

"The Value of Research in Nonferrous

The Wilbur Mine crew of the Commerce Mining & Royalty Company which won the 1929 accident prevention trophy in the Tri-State District Contest.

The mine worked 22,055 consecutive manshifts during the year without a lost-time accident. Charles Keith is superintendent of the Wilbur Mine, Carl Williams and Victor Keller, ground foremen, and F. E. Asher, mill foreman. Mr. Keith is in the center of the picture holding the cup. Henry Giessing, safety director for Commerce Mining & Royalty, is shown at the right of the picture wearing a hard-boiled sport cap. The "Pete" flags shown were awarded for over 3,000 consecutive manshifts worked without a lost-time accident, and the "New Broom" flag was awarded for over 6,000 manshifts without a lost-time accident.

Incidentally, two other mines in the district—the Jaybird and the Beaver—and the Gosling tailing mill also finished the year without lost-time accidents, but the number of manshifts did not compare with Wilbur's record.

Metals" was discussed in a paper read by Dr. H. W. Gellett, director of the Battelle Memorial Institute, who told of the large sums expended in research work by the telephone, electric company, and other successful and progressive corporations. He cited the advances of aluminum as the results reached by research work.

He pronounced research as the business industry's insurance for tomorrow, and attributed the growth and prosperity of aluminum, nickel, copper and brass to the results of well-directed research methods efficiently practiced.

Zinc's future in its relation to the galvanizing industry, one of the largest outlets for the metal, was poignantly stated to be in the twilight hour—either of its evening of use, or in the van of a new dawn—just according to the action the industry took regarding its future, George A. Charls, president of the National Association of Rolled Steels Manufacturers, told the zinc men.

"The sheet steel industry," he said, "is not so much interested in selling zinc coated sheets as it is in the advancement of the consumption of steel. The industry has pushed zinc coated sheets, because they offered the best material for the prevention of corrosion, but if some other material, or some other industry, was proven to have superior qualities, then the steel industry would go to the other product.

"The zinc industry, through the institute, should immediately begin a research program which would have for its purpose the convincing of the users of zinc that it was a superior product."

William A. Willis, manager of the Copper & Brass Research Association, was on the program to read a paper on "Zinc in Brass." Unable to be present at the meeting, Mr. Willis sent his article to be read at the meeting by the secretary. He discussed the close relationship and demands of zinc and copper, the component parts of brass, and explained the energetic methods used by the organization of which he is manager, in developing more uses for brass and bronze. He told of the benefits derived from the research work in the copper and brass industry and how zinc must necessarily share in those benefits.

Zinc mining developments in different states were featured in the several papers read at the third day's session.

A paper written by C. M. Chaplin, Jr., of the St. Joseph Lead Company, and read by Secretary Conover, covering New York State, stated that considerable development work was being done in that state and spoke of an increased production.

Tennessee and Virginia as zinc producing states, were covered by Howard I. Young, of the American Zinc, Lead and Smelting Company.

Oliver C. Ralston, director of research for the United Verde Copper Company, covering Arizona, spoke of the increased activities in that state in the development of zinc properties.

W. N. Smith, general manager of the Vinegar Hill Zinc Company, reporting for the Wisconsin-Illinois district, said that conditions in that field were not exceptionally bright, and that little increase in production could be hoped for under present conditions.

P. B. Butler read a paper covering the western states, and prepared by J. O. Elton, manager of the International Smelting Company. The paper did not state that any increased production was anticipated, but Mr. Butler, in commenting on the paper, said he understood that many of the copper mines were gradually working into zinc properties and that the west still remained a menace to the Tri-State district.

The Tri-State district was the subject of a paper by M. D. Harbaugh, secretary of the Tri-State Zinc and Lead Ore Producers' Association.

"General economic conditions in the district are far from satisfactory," Harbaugh said. "Despite the fact that many workmen have left the field in the past three months, there is an excess of labor and little prospect of employing it very soon. As noted above, the number of mills in operation at present is about half that of a year ago, and the prospects for improvement in the next few months are not very encouraging.

"A glimpse into the future of the district reveals movements toward greater consolidation of company interests, larger acreages per mill, and larger and more efficient mining and milling operations. These factors will tend to off-set the greater unit costs occasioned by the gradually lowering grade of mine dirt so that concentrate ton costs may be maintained at something near their present figures, if not actually considerably lower."

The annual election of officers resulted in the reelection of R. M. Roosevelt as president; A. P. Cobb, J. A. Elton, and John A. Robinson, vice presidents; Howard I. Young, treasurer; and Julian D. Conover, secretary.

At a meeting of the board of directors, the following directors were elected in accordance with the recommendation of the nominating committee: C. F. Dike, Stanley Eaton, Julius W. Hegeler, John A. McCarthy, William A. Ogg, Jesse A. Starr, Henry Wardner and Howard I. Young. The board added to its membership the name of J. A. Elton, of Salt Lake City, Utah, who was also elected a vice president.

Washburn Named Manager of Federal Mining & Smelting

H. G. Washburn has been appointed as general manager of the Federal Mining & Smelting Company to succeed Frederick Burbidge who retires from that position. Mr. Washburn has been assistant general manager of the company since 1925. He is a graduate of the Colorado School of Mines of the class of 1904, and served for a number of years after his graduation with the American Smelting & Refining Company in the Tri-State District, and in Utah.

A. S. & R. Acquires Frisco Lulu Property

The American Smelting & Refining Company has purchased control of the Frisco Lulu Mining Company property located in the Frisco District, near Milford, Utah. The company is planning an active development campaign at the property, the old 700-ft. shaft to be retimbered, according to A. H. Means, manager of the mining department of the Western Division of the smelting company. The Frisco Lulu adjoins the famous Horn Silver property on the north, acquired by the Tintic Lead Mining Company about two years ago. The Union Pacific Railroad has spent approximately $40,000 for improvements on their branch line into the district during the past year.

Nineteen Tri-State Mines Without Accident for 1930

Nineteen mines and two float plants in the Tri-State District worked through the first quarter of 1930 without a lost-time accident, according to records kept by the safety department of the Tri-State Zinc and Lead Ore Producers' Association.

Thirty-three mines and float plants worked throughout the month of March without a lost-time accident.

Montana Mines Pay Large Special Tax

Mines in Montana, during the five-year period ending December 31, 1930, will have paid a total of $2,507,695.11 into the State Treasury in the form of a special gross output tax, or what is known as the metal mines tax, according to figures announced by the State Board of Equalization. This payment is in addition to the regular property tax, and likewise the net proceeds tax.

Practically the entire amount of this special tax which was adopted in 1925, comes from the Butte District, and approximately 90 percent from the Anaconda Copper Mining Company. The sliding scale on which the tax is based provides that the first $100,000 produced shall be exempt; a tax of one-fourth of 1 percent on the next $150,000; one-half of 1 percent on the next $150,000; three-fourths of 1 percent on the next $150,000, and 1 percent on production over $500,000.

PENNSYLVANIA'S SCHOOL OF MINERAL INDUSTRIES

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graduated at the universities of West Virginia and Illinois and specializes in coal preparation. Robert T. Gallagher, instructor in mining, was graduated from Penn State, and has had three years of experience in the operating and engineering departments of the Bethlehem Mines Corporation.

Thus far mining instructors have thought largely in terms of engineering. Mining of the future requires the application of the pure science as well as engineering, and the department of mining plans to employ a so-called mining chemist who will think of mining problems in terms of chemistry and physics. In this step, as in many others, the school is not allowing tradition to strangle progress.

Experiment Station

The mineral industries experiment station forms a powerful aid to graduate instruction, a training which is essential to qualify men for the highest type of research. Young men are being trained to make investigations into the less understood problems which confront the mineral industries of the state. In addition, research is carried on for the benefit of the industries with particular reference to mining, beneficiating, processing, and utilizing mineral substances.

Contact with the research staff of the experiment station is stimulating and helpful to the undergraduate students and the instructional staff. The plan provides the faculty with facilities for part-time and summer period research. The industrial contacts made through the experiment station work make the teaching facilities of the school better known to the people of the state. The mineral industries experiment station is the logical agent for making such departmental state investigations as may require laboratory and research facilities.

Six bulletins covering the results of research have been published and four additional manuscripts are under preparation.

Department of Extension

The Pennsylvania State College makes its educational services available to the entire citizenry of the state. The character of the mineral industries prevents a wholesale exodus into classrooms, so the extension idea has become an important factor in the state's School of Mineral Industries. More than 1,800 bituminous men and 2,000 anthracite men have completed extension courses. What investment can a state make that will yield greater dividends than one which helps to provide capable workmen to man its basic industries?

Mining extension in western and central Pennsylvania is under the direction of William G. Duncan, and in the anthracite region it is supervised by Frank Sluzalis. These men are certified first grade mine foremen in their respective regions and have passed state examinations for mine inspector. Some of the mining extension work is carried on under the Federal Smith-Hughes plan in cooperation with the State Department of Public Instruction.

Alumni Accomplishments

More than 700 men have been graduated from the School of Mineral Industries at the Pennsylvania State College. The majority of the graduates are engaged in Pennsylvania industries and at least 90 percent are still in engineering and technical work. Outstanding graduates of the school include men who are holding positions of great responsibility. Some of these include 3 presidents, 6 vice presidents, and 22 general managers and superintendents of our largest mining and steel companies; also nine high Government and state officials and 10 consulting mining and metallurgical engineers and consulting geologists. Scores of graduates hold prominent positions as administrators, engineers, geologists, and college instructors. Six photographs of alumni are given herewith and it is significant that four of them, namely, William L. Affelder, John C. Cosgrove, George H. Deike, and Jesse B. Warriner, are members of the board of trustees of the college.

Hearty Public Approval

The Pennsylvania State College feels that the new building and the new program of the school have hearty public approval and the unqualified cooperation and support of those engaged in the mineral industries of the state. At no time in the history of the institution has it enjoyed such close contact and cooperation on the part of the industries as attested in the interest shown by the various advisory boards established for the school in recent months. The advantages in maintaining these contacts are obvious. The college is a public institution, the mineral industries represent the largest single tax-paying group in the commonwealth and they are justified in looking to their School of Mineral Industries for such educational service as will help them to meet competition with neighboring states, thus contributing a full share to the prosperity of Pennsylvania and its people.

GOVERNMENT EXPLORATIONS GIVE PROMISE OF DEVELOPMENT OF DOMESTIC POTASH INDUSTRY

THE existence of bedded deposits of potash salts of such thickness and purity that they may be mined cheaply is demonstrated, according to the Bureau of Mines, as the result of the governmental exploration program in Texas and New Mexico, conducted by that Bureau in cooperation with the Geological Survey. The principal potash mineral disclosed by the Government drilling is polyhalite, a sulphate of lime, magnesia, and potash, which contains an average of 12 to 15 percent of potash (K_2O). Experiments by the Bureau at its Nonmetallic Minerals Experiment Station, New Brunswick, N. J., have resulted in the development of a process which gives promise of the economic production of refined potassium salts from polyhalite. Two products are obtainable, potassium sulphate and the sulphate of potash-magnesia, and mixtures of the refined sulphate and the crude polyhalite can be made to yield the various commercial grades of mixed salts.

Estimates of the cost of production indicate that potassium sulphate can be produced at a treatment plant in Texas or New Mexico for approximately $16 per ton and the double sulphate of potash-magnesia for approximately $8 per ton. Although transportation charges to market must be added to these costs, it is shown that at present prices potash salts from Texas and New Mexico can be delivered to the principal markets of the United States more cheaply than foreign salts.

A study of foreign production costs indicates that, although a material reduction in the current prices of potash salts is possible, conditions in the industry are such that prices are apt to remain fairly stable at present levels as long as the Franco-German sales agreements remain in force and until the German industry has completed its present reorganization and concentration of production in the best mines, states James S. Wroth, mining engineer, in a report just made public by the Bureau of Mines. When these have been accomplished, a reduction in the price of potash salts appears probable, but such a reduction will probably not be drastic. Price cutting aimed directly at a growing American production seems unlikely on account of the overwhelming importance of the domestic market in Germany and France, as compared with the American market, and the fact that a cut in prices that would be effective against American production would mean a corresponding cut in domestic prices and a loss of profit in the important domestic market.

Up to 1914 almost all of the world's supply of potash came from Germany and Alsace. The Alsatian production was controlled by Germany, which enjoyed an almost exclusive monopoly of potash production and took full advantage thereof by regulation of output and control of prices. In common with the rest of the world the United States depended upon Germany for its supply of potash. This dependence upon foreign sources was emphasized strikingly by the acute shortage of potash in this country that followed cessation of shipments from Germany during the World War.

The importance to this country of a domestic supply of potash was evident, and the shortage of potash, with the resultant high prices, stimulated the active development of domestic resources. The domestic production increased rapidly and by 1918 supplied about one-fifth of the country's normal requirements; but production costs were high, and the industry could succeed only as long as high prices prevailed. With the close of the World War and the arrival of large shipments of German potash at prices below pre-war figures the American industry virtually collapsed. The two American producers that managed to survive have continued to operate successfully and now supply about 20 percent of the American requirements for potash. The country depends upon foreign potash for the remaining 80 percent of its needs.

The experience of the industry during the war showed that not only was a domestic source of potash required but that production must be at costs low enough to allow competition with foreign potash on a price basis.

Among the domestic potash resources which were brought to the attention of the country during and after the war but were not utilized as a source of potash, although they indicated that they might furnish the cheap potash desired, were the potash deposits occurring with the thick rock-salt formations of western Texas and southeastern New Mexico. In this area potash minerals were identified in the cuttings and sludges of wells drilled for oil. The evidence of these cuttings was inconclusive. The occurrence of potash salts was definitely proved, but the character, size, and richness of the deposits could not be determined from the samples and cuttings obtained. To obtain definite information regarding these deposits, core drilling was necessary, and as private capital was reluctant to enter this field the Federal Government undertook the investigation. In 1926 funds provided by Congress for this purpose became available, and core drilling was begun by the Bureau of Mines in 1927. To date, 16 wells have been completed, 9 of these being in Texas and 7 in New Mexico.

From a mining standpoint the potash beds may be considered as completely inclosed by a firm massive salt formation, a material of sufficient strength to stand exceptionally well in open mine workings and not subject to alteration or decay on exposure to mine air.

The potash beds are practically level. The slight structural gradient of the synclinal basin amounts to only a few feet per mile, which for practical purposes, in mining, may be considered as level. Some local folding may be found, but in general throughout the area under consideration the deposits may be taken as horizontal.

The potash deposits disclosed by the Government drilling occur at depths of 350 to 1,950 ft., but for a general estimate 1,200 ft. may be taken as the average.

The salt formation in which the potash deposits occur is overlain by a series of soft shales and sandstones in which thin beds of limestone are also found.

The potash (K_2O) content of pure polyhalite is 15.6 percent. With the exception of a small showing of carnallite in well 12, polyhalite is the only potash mineral found in the wells drilled in Texas, but in New Mexico in wells 1 and 2 thin seams and small scattered masses of sylvite, carnallite, kainite, and langbeinite were observed.

Further details are given in Bureau of Mines Bulletin 316, "Commercial Possibilities of the Texas-New Mexico Potash Deposits." Obtainable from Superintendent of Documents, Washington, D. C., 25 cents.

Committee to Study Alaskan Needs

Secretary of the Interior Wilbur has announced that the President has formed the three commissioners for Alaska appointed under the act of February 10, 1927, into a committee to recommend steps for improving governmental administration in Alaska. The first meeting of the committee will be held in Juneau, Alaska, during April, to begin a study of the administrative problems presenting themselves in the far north.

These commissioners represent departments of the Federal Government in Washington. The purpose of the committee is to determine by study whether recommendation could be made leading to the placing of more authority for the control of Alaska in that territory rather than in Washington, and thus increasing the opportunity for the economic and commercial development of the territory.

Anthracite Tariff Out of Tariff Bill—Embargo Seen Possible

Proponents of an embargo of some sort on importations of Soviet anthracite received a set-back on April 22, when the Joint Conference Committee of the House and Senate adopted the Senate version of Section 307 of the tariff bill without making any of the changes sought by anthracite operators and Pennsylvania Congressmen from the anthracite region, thereby closing one avenue to the exclusion of the imports. Section 307 prohibits the entry of all products mined or manufactured by forced labor after January 1, 1932. The conferees added a clause to the provision so that it would apply only to goods in competition with American products. The Pennsylvania members of Congress sought to change the provision by either eliminating the effective date altogether or making it effective immediately in the case of anthracite.

It now appears that any exclusion of the Russian product must be accomplished by an executive order, through that section of the tariff law authorizing the President to place an embargo upon any product imported, or produced abroad, under unfair methods of competition. A decision of the United States Court of Customs Appeals on April 10, affirmed the authority of the President to bar completely from this country any products imported under unfair competitive conditions. The sole difficulty in the way of securing a presidential proclamation barring the Soviet anthracite, it is believed, is the establishment of definite evidence as to the conditions under which the Siberian product is mined. The Treasury Department is investigating this phase of the matter.

The House version of Section 307 covered only manufactured products and becomes effective automatically when the tariff bill becomes a law. The Senate amended this section to include products of mines, but moved up the effective date to January 1, 1932. Inasmuch as any changes made in the tariff provisions had been made in the joint conference committee, after both houses had passed the bill, the Pennsylvania anthracite bloc submitted a brief to the members of that committee petitioning them to make the ban on anthracite effective immediately.

"The reason for the proposed change," stated the brief, "is that the anthracite coal industry has suffered a severe setback since 1925, and if Siberian anthracite produced by convict, forced or indentured labor, is permitted to enter United States ports in increasing amounts as is shown by the importations for the last 16 months and continues to January 1, 1932, it might prove ruinous to the industry."

The members of the House signing the petition were Magrady, of Mt. Carmel; McFadden, of Canton; Turpin, of Kingston; Watres, of Scranton; Doutrich, of Harrisburg; Brumm, of Minersville, and Coyle, of Bethlehem.

In March, Representative Brumm announced that he intended to introduce an amendment to the tariff bill levying a duty of $4 a ton on anthracite. It developed, however, that this procedure was not feasible, inasmuch as the bill had already been passed by the House.

At a conference held at the Treasury Department on April 16, supporters of an anthracite embargo secured the cooperation of three members of the President's cabinet—Secretary Mellon, of the Treasury; Secretary of Labor Davis, and Secretary of Commerce Lamont. The conference was attended by members of the House from Pennsylvania, and representatives of the industry, including Roy C. Haines, of Wilkes-Barre, secretary of the Anthracite Cooperative League; George Lewis, legislative counsel of the United Mine Workers; Noah H. Swayne, head of the Anthracite Institute; Roderick Stephens and Joseph A. O'Toole, both of the National Retail Coal Merchants Association. Secretary Mellon, who presided, announced that further conferences will be held with the Cabinet associates and indicated if legal authority can not be found in existing statutes, indorsement of the necessary legislation will follow.

Western Maryland Railway Brings Suit Against Consolidation Coal Company

The Western Maryland Railway Company has brought suit in the Court of Common Pleas in Philadelphia against the Consolidation Coal Company for alleged breach of contract. The majority of the coal company stock, it is said, is owned by John D. Rockefeller, Jr., and interests controlled by him. It is alleged that the contract, authorized in 1915 by John D. Rockefeller, Sr., contained a guaranty by the Consolidation Coal Company that if the railway company would spend about $10,000,000 in building certain lines to reach, and in equipping itself to serve the mines of the coal company, the latter would ship 3,250,000 tons of coal annually over the Western Maryland during a 50-year period. It is averred the railway company spent the money, but the coal company failed to ship the coal.

On April 3 of this year, the coal company brought suit in Baltimore against the Western Maryland repudiating the contract, claiming that the president of Consolidation had no authority to execute the contract. When the contract was made, it is said, the Rockefellers also dominated, if they did not actually control, the Western Maryland. Directors representing the Rockefellers sat on the boards of both companies. The coal company claims that the contract was rescinded by the mutual consent of the two Rockefeller-controlled companies. In February, 1928, the Rockefellers sold their stock in Western Maryland.

Winners Announced in Coal Slogan Contest

The National Retail Coal Merchants' Association has announced the prize-winners in the recent slogan contest. The first prize was awarded to Herbert Moeller, of Urbana, Ill., for his slogan

Comfort Of American Life.

Mr. Moeller is an instructor of the University of Illinois. Governor Lewis B. Emmerson, of Illinois, presented him with a certified check for $500.

The other prize-winning slogans follow in their order of award:

"Use Coal Unless You Have Money to Burn"; "Burn Coal! 2,000 Reasons in Every Ton"; "Heat the Economicoal Way"; "Save Safely With Coal"; "Cold Time is Coal T i m e" (six awards); "Between Two Fires Choose Coal"; "Buy Coal When Reasonable, Burn When Seasonable"; "Coal Makes Warm Friends by the Ton"; "Warmth Without Worry" (six awards); "Tons of Comfort" (eight awards); "Be Coaled and Warm"; "King Coal and His Fiddlers Three, Heat, Comfort and Economy"; "Comfort Obtained At Less"; "Use Coal—Save and Be Safe"; "Coal in Your Bins Keeps Health Within"; "Your Coal Man Sells Health"; "There's Nothing to Learn—Just Buy and Burn"; "Be Safe and Save With Coal"; "Coal—The Carbon Copy of the Sun."

All of the slogans have been copyrighted and are the property of the National Retail Coal Merchants' Association.

Lake Coal Shipments

Shipments of bituminous coal to Great Lakes ports for loading into vessels as cargo in 1929 amounted to 37,771,908 net tons, according to statistics published by the Bureau of Mines. Shipments by states were as follows: West Virginia, 9,759,244 tons; Pennsylvania, 7,874,443 tons; eastern Kentucky, 6,814,482 tons; Ohio, 3,208,528 tons; Virginia, 72,168 tons, and Tennessee, 43,043 tons. The 1929 shipments represent a considerable increase over 1928 when 33,323,724 tons were shipped via lake, and established a new record for all time.

Sovereignty in Miners' Union up in Illinois Court April 30

The battle to determine sovereignty within the United Mine Workers of America advanced to a critical stage the middle of April, when John L. Lewis, international president of the union, and 32 of his associates were ordered to appear in the Sangamon County, Illinois, Circuit Court on April 30, and show cause why they should not be held for contempt of court for violating an injunction issued last October, restraining Lewis from wresting control of the union in Illinois from Harry Fishwick, president of the Illinois miners union and other state officers, or interfering in any way with union activities in the state.

Fishwick and other opponents of Lewis in Illinois, Kansas, Iowa, Indiana, and Ohio, recently organized an insurgent union on the ground that the old organization was not in existence after March, 1929, due to the failure of Lewis to call a constitutional convention. The reorganized union held its convention in Springfield in March at the same time that the Lewis organization met in Indianapolis.

Attorneys for State President Fishwick asked that Mr. Lewis be called into court for contempt, after the international president established a provisional government for the union in Illinois, and expelled 20 members of the insurgent group. The restraining order specifically forbade Lewis to set up a provisional government. Frank Hefferly was named by Lewis as provisional president of district 12 (Illinois), and ordered to proceed with his work.

Among the 20 expelled were John H. Walker, president of the Illinois Federation of Labor; Harry Fishwick, president of district 12; George Mercer, district vice president; Walter Nesbit, district secretary-treasurer; J. M. Thornton and Oral Daugherty, of Ohio; Alexander Howat, president of the Kansas district, and members of the board of district 12.

The enjoining order approved by the court, held that Mr. Lewis might damage property rights of members of the United Mine Workers of America in this state by revoking the Illinois charter.

Officers of the provisional government contend, however, that the injunction which was issued in October of last year does not apply to the present situation. They claim that by participating in the reorganization convention in March at which Alexander Howat, of Kansas, was elected president of the new "International Mine Workers of America," the Illinois officers are guilty of dual unionism and are no longer members of the union.

The first action of mine operators in Kansas district No. 14 against recognition of the insurgent organization headed by Howat was taken when the operators withheld the "checkoff" from all except nine local mine unions.

The action was taken, spokesmen for the operators said, under instructions from W. L. A. Johnson, Kansas City, general commissioner for the southwestern field.

In a referendum April 10, miners in the district voted, approximately 1,700 to 40, to send their national dues to the Howat organization at Springfield, Ill., instead of to the organization headed by Lewis.

State Mine Chiefs Form Association

The State Mine Chiefs Association of America was formed April 22, at a meeting at the Pittsburgh station of the United States Bureau of Mines. The association, which has as its purpose the furtherance of mine safety in which the Bureau of Mines cooperates with the state departments, will be composed of the mine chiefs of 17 mining states of the nation.

R. M. Lambie, head of the West Virginia Department of Mines, was named president of the organization; Walter Glasgow, secretary of the Pennsylvania Department of Mines, vice president, and J. J. Rutledge, chief of the Maryland State Bureau of Mines, secretary-treasurer.

E. W. Smith, chief of the division of mines in Ohio, and John Hillhouse, director of Illinois mines, were chosen to serve with the three officers as members of the board of directors.

States to be represented in the new association in addition to those named are Alabama, Indiana, Tennessee, Virginia, Kentucky, Oklahoma, New Mexico, Colorado, Wyoming, Michigan, Missouri, and Kansas.

The next meeting of the association will be held at Louisville, Ky., September 15, prior to the international mine rescue and first aid meeting there September 16-18.

On April 23, the mine chiefs visited the Bureau of Mines experimental mine at Bruceton, Pa., to witness a number of tests.

National Coal Association Meeting

The Thirteenth Annual Meeting of the National Coal Association will be held October 15, 16, and 17, at the Book-Cadillac Hotel, Detroit, Mich. This was decided at a meeting of the annual meeting committee in New York, April 4. Chas. A. Owen, president, Cambria Smokeless Coal Co., New York City, the chairman of the committee, presided at the session.

Anthracite Mine Workers Meet to Plan for Wage Scale Negotiations

The Tri-State convention of the United Mine Workers, representing the anthracite region, will convene in Hazleton, Pa., on April 30, to consider matters in connection with a new wage agreement to be negotiated with the anthracite operators. The present wage contract, which has been in effect since February 12, 1926, expires August 31. April 30 is one of the earliest dates ever fixed for the deliberations, and is due, it is said, to the desire of both the union and the operators to come to an early agreement and avoid disruption of the industry by a shutdown of the mines if an agreement is not reached by the end of August.

When the mine workers' convention meets, the scale committee will be instructed to exert efforts to have a clause inserted in the new agreement calling for equalization or work among employes of the various coal companies in the three anthracite districts. A resolution embodying this request was adopted recently by the general grievance committee of the Hudson Coal Company.

Swayne Heads Anthracite Institute

Noah H. Swayne, well known in anthracite circles, and for the last two years administrator of the Philadelphia Retail Coal Conference, has been appointed to succeed Daniel T. Pierce, whose resignation as vice chairman of the Anthracite Operators Conference took effect April 1. Mr. Swayne will have the title of executive director of the Anthracite Institute, which, as of April 1, 1930, succeeds the Anthracite Operators Conference as the organization under which the various activities of the anthracite industry will function. These activities consist of the Anthracite Coal Service, the Anthracite Bureau of Information, Traffic Bureau, Credit Bureau, and Research Department. The Anthracite Board of Conciliation, which was established by the award of the Anthracite Coal Strike Commission in 1903, is not a part of the Institute.

Lake Cargo Coal Rates

Railroads serving the southern fields have petitioned the Interstate Commerce Commission to dismiss the complaints of Ohio and Pennsylvania coal producers which seek readjustment of the rates on lake cargo coal. The southern roads, the Chesapeake & Ohio, Louisville & Nashville, Norfolk & Western, and the Virginian, said the complaints failed to show any injury due to the present tariffs. They asked that they be not required to answer the complaints until

their motion for dismissal had been heard in oral argument before the entire commission.

The Western Pennsylvania Coal Traffic Bureau, of Pittsburgh, filed an answer to the motion of southern railroads, contending that the mere fact that rates from the western Pennsylvania and eastern Ohio coal fields are lower than rates from southern competing territory does not necessarily imply that they are unfair. Existing differentials, they say, still afford the southern shippers an artificial advantage over northern shippers with a natural geographic proximity to lake ports. The Bureau renewed its request for a general study of the rate structures of both territories.

Hudson Coal Collieries Resume Operations After Shutdown

Collieries of Loree division of the Hudson Coal Company, in Larksville and Plymouth, resumed operations on April 24. Approximately 3,000 men returned to work. It is believed that coal orders on hand will keep the division collieries working indefinitely.

Loree division employes have been idle a number of weeks. Recently the employes asked officials of District 1, United Mine Workers, to confer with coal company officials to seek an equalization of work among employes of all collieries of the concern. Following a meeting with an international representative of the miner's union, A. M. Fine, vice president and general manager of the company declared that the division collieries would resume work.

Evening Mining Classes Growing in Pennsylvania

The increasing interest is being shown in evening mining classes in Pennsylvania mining district according to the Vocational Division of the State Department of Public Instruction, particularly in the bituminous regions.

During the year 1929-30, 30 centers conducted evening mining classes for those engaged in the mining industry, 18 of them in the bituminous region. Last year there were but 12 such schools in operation under public school supervision. Luzerne was the leading county in the anthracite region, having conducted five evening mining schools. In the bituminous region, Somerset led with six schools; Cambria County was second with five.

These schools, conducted under supervision of local school districts, Department of Public Instruction, and the Pennsylvania State College School of Mines, received financial aid as provided by the state and Federal Vocational Education acts.

Skyscraper Builders Visit Mines to Study Cable Suspension Methods

The methods employed by mining companies in extending electric cables down shafts and bore holes were the subject of a study recently by a party of engineers representing the New York City engineering departments and several utility companies in an effort to devise better and simpler means of suspending electrical cables in the modern skyscrapers. The delegation visited Wilkes-Barre, Pa., on April 11 and 12, and were the guests of the Pittston Company, Glen Alden Coal Company, Lehigh Valley Coal Corporation, Hudson Coal Company, and Susquehanna Collieries Company.

Wage Agreement Signed by Indiana Strip Operators

The joint scale committee of the Indiana Coal Producers' Association and District No. 11, United Mine Workers of America, has reached an agreement on a wage scale and working contract to replace the agreement which expired March 31. The new contract will be in effect until March 31, 1931. The wage scale of $6.10 as embodied in the old contract was retained in the new agreement. The contracts of both the deep vein mines, which was signed several days before, and the strip mines, just signed, must be ratified by the delegates of the miner's convention, which will be convened shortly.

Dorrance Candidate for Lieutenant Governor of Pennsylvania

Charles Dorrance, of Scranton, Pa., former vice president and general manager of the Hudson Coal Company, has announced his candidacy for the Republican nomination for Lieutenant Governor of Pennsylvania, on an anti-dry platform.

Carnegie Mining Advisory Board Meets

The spring meeting of the mining advisory board of the Carnegie Institute of Technology was held in Pittsburgh the latter part of March. At the meeting, which was presided over by Dr. L. E. Young, chairman, committee reports were received, and it was stated that the study of coking problems and the agglutinating power of coal, which is now being conducted at the Institute, will be continued. The problems of smoke abatement came in for discussion, and more technical training in combustion engineering for coal salesmen was advocated by W. L. Affelder, vice president of the Hillman Coal & Coke Company.

A communication to the National Coal Association was authorized, stating that "it is the desire of the board that cordial relations between your Association and the Carnegie Institute of Technology may long be continued." The National Coal Association has sponsored a research fellowship at Carnegie for five years.

Fire Destroys McKell Coal Company Power Plant

Five mines of the McKell Coal Company were forced to suspend operations and a property loss of approximately $200,000 was suffered April 16, when fire destroyed the equipment in the company's power plant at Kilsythe, W. Va. The mines affected are the Kilsythe, Oswald, Graham, Siltix and Tamroy.

Philadelphia & Reading Begins Operation of World's Largest Breaker

Operations at the Philadelphia and Reading Coal and Iron Company's new $4,000,000 anthracite breaker at Locust Summit, Pa., were started April 1. The structure is the largest anthracite breaker in the world.

This is the first complete unit to be furnished in the mammoth program of electrification and expansion undertaken by the company, involving the expenditure of millions of dollars in improvements.

Some idea of the tremendous size of the Locust Summit breaker may be obtained from the fact that more than 3,000 tons of structural steel and 5,700 cu. yds. of concrete went into its construction.

Other improvements are scheduled to go forward rapidly.

Indiana Strip Operators to Continue Reforestation Work

Strip coal operators working in southwestern Indiana, have agreed to continue the program carried on in the past two years of reforesting the banks from which the coal has been removed in order to turn these unsightly wastes into forest areas. This statement was sent to Richard Lieber, director of state conservation, who inaugurated the work. Operators who have taken an active interest in state forestation and particularly on their own worked-out lands are: Enos Coal Company, Oakland City; Central Indiana Coal Company, Winslow and Dugger; Maumee Coal Company, Linton, Jasonville, and Clay City; Modern Fourth Vein Coal Company, Jasonville; United Electric Coal Corporation, Farmersburg and Clinton, and the Hickory Grove Coal Company, of Riley, Ind.

Company Labor Agreements Basis of Opposition to Court Appointee

William Green, president of the American Federation of Labor, appeared before a Senate Judiciary subcommittee on April 5, to protest the appointment of Judge John J. Parker as an associate justice of the United States Supreme Court. One reason the Federation opposed the nomination, Mr. Green said, was based on the "decision which he rendered in the case of the United Mine Workers of America vs. Red Jacket Consolidated Coal and Coke Company, and the opinion in which he concurred as rendered in the Bittner vs. West Virginia-Pittsburgh Coal Company case.

"Our action in opposing the confirmation of the appointment of Judge Parker is based upon a study of his qualifications, his life's environment, his point of view regarding human relations in modern industry, and his judicial attitude toward economic and industrial problems which seriously affect the material and moral well-being of working men and women," Mr. Green said.

"It is alleged that the opinion of Judge Parker was based upon the existence of what labor appropriately terms 'yellow dog' contracts. These so-called contracts provide that the employes of the coal company can not join a labor union while serving as employes of the company. Judge Parker held that because these 'yellow dog' contracts were in effect it was unlawful for representatives of organized labor to unionize the workers who were parties to the 'yellow dog' contracts, or to solicit them to join a trade union without the company's consent.

"Judge Parker in the Red Jacket case has gone far beyond the doctrine of the Supreme Court of the United States, and has stated it to be unlawful by any means to endeavor to persuade an employe to join a union while under such a contract with a company."

T. C. Townsend, of Charleston, W. Va., who represented the United Mine Workers in their case against the Red Jacket Consolidated Company, stated that the opinion of Judge Parker in sustaining an injunction in connection with this case "is not sufficient to warrant disapproval of his confirmation."

Mr. Townsend testified that he had raised the question of the legality of the "yellow dog" contracts in his brief in appearing for the United Mine Workers in the Red Jacket case. He pointed out that the court did not act on the validity of the contract because the question of validity was settled in the Hitchman case. "I think Judge Parker felt in this case that he was bound by the Hitchman case," said Mr. Townsend. He expressed the opinion that the question of "yellow dog" contracts was one to be settled by legislation and not by the courts.

Illinois State Geological Survey Meeting

The Illinois State Geological Survey will on April 30 and May 1, hold its quarter-century celebration, 1905-1930, at Urbana, Ill. The forenoon session will be devoted to a discussion of geological investigations in Illinois at which a paper will be presented by Dr. H. Foster Bain, secretary of the American Institute of Mining and Metallurgical Engineers. The afternoon session will be devoted to a symposium of the research needs of the Illinois coal industry, and will be addressed by officials of the University of Illinois Experiment Station, as well as several officials of the Illinois coal mining industry. Dr. Henry Mace Payne, consulting engineer of The American Mining Congress, will be a speaker at the banquet to be held on April 30. The subject of Dr. Payne's address will be "The Importance of the Geological Survey in Industry."

Sources of Bituminous Coal Used for Railroad Fuel

The Bureau of Mines has recently completed a study in cooperation with the Brookings Institution on the sources of bituminous coal used for railroad fuel. The subject of distribution, the Bureau points out, is the least known of any of the factors in the coal market, and there is a widespread demand for statistics on the movement of coal from mine to place of use. The consumption of many of the principal users, such as the public utilities, coke plants, railroads, and the larger industrials, is now reported monthly or quarterly, and the stocks on hand are surveyed quarterly in the Bureau's regular report on commercial stocks of coal. Concerning the movement of coal from producing district to point of consumption, comparatively little is known. The last complete survey of distribution was made by the United States Geological Survey in 1918 and published under the title, "Coal in 1918, Part B, Distribution and Consumption."

"Certain of the larger movements of bituminous coal are analyzed by statistical bureaus maintained by the carriers, such as the Ohio Bureau of Coal Statistics, the Ore and Coal Exchange, and the Illinois Freight Association," says the Bureau. "To get complete data for all fields is a difficult and very expensive task because of the thousands of mines involved and because much of the tonnage must be traced through wholesalers when, as often happens, the producer does not know the ultimate destination."

Similar studies on the origin of coal consumed by public utilities and by coke plants are in preparation.

Petroleum Demand Forecast

Through the volunteer services of a Committee on Petroleum Economics made up of J. Elmer Thomas (chairman), Joseph E. Pogue (secretary), Ray M. Collins, H. W. Lowrie, Jr., and H. P. Grimm, the Federal Oil Conservation Board is in receipt of a report estimating the requirements for petroleum and its products.

The 1930 demand for gasoline is estimated to be 476.7 million barrels, an increase of 9 percent over the 1929 demand. This quantity of gasoline can be supplied from a domestic crude oil production of 942.8 million barrels, or 2,583,000 barrels per day, if the output of cracked gasoline is 161 million barrels and there is a moderate draft on stocks of gasoline and of fuel oil. This schedule calls for refinery runs of 957.8 million barrels, or 2,624,000 barrels per day. The domestic crude oil requirement of 942.8 million barrels, introduced into a balance sheet of total supply and demand, indicates that this quantity is sufficient to meet the expected demand for all oil, with a draft of 30.1 million barrels on over-all stocks. The domestic crude oil requirement has been allocated to the principal producing areas for the last nine months of 1930 as follows, in thousands of barrels per day: California, 610; Oklahoma, 655; Texas, 750; all others, 480; from storage, 78; and total United States, 2,573.

MINING METHODS CAMPBELL MINE

(*From page 480*)

made to eliminate this loss. A small amount of dilution may occur at the edges of the stopes where the contact is an economic one, as with silicious low grade. Usually the contacts are rather sharply defined so that very little dilution results.

Comparison of Different Methods Used

The semi-shrinkage method has the advantage over the cut and fill method in that there is less flooring expense. Also, due to the longer cycle of operations, a better chance for specialization is afforded, thus increasing the efficiency of the labor. It has the disadvantage that additional care is necessary in the final trimming of the back and that the sets must be anchored to the solid. A larger proportion of ore is tied up over a longer period in the semi-shrinkage stopes and a greater waste demand occurs over a short period to avoid excessive periods of idleness during the filling stage.

Costs

Since the discussion in this paper has been confined to the methods used in an area producing a minor part of the total tonnage, it is deemed advisable to include in the costs only the direct charges which relate to the methods under discussion.

It is further considered that direct charges more nearly represent the information desired for comparison, as the local conditions are reflected in the general charges and as such are influences that do not effect the methods discussed.

WITH THE MANUFACTURERS

Radio Call Received for Safety Equipment

"Please rush word to Mine Safety Appliances Company, Pittsburgh, Pa., to send 100 canisters for All-Service masks to explosion at Kettle Island, Ky. Needed at once." That was the unusual code message picked up by a radio amateur about midnight one Sunday recently and hurriedly relayed by telephone to the Mine Safety Appliances Company.

The urgency of the call was at once realized. No further confirmation was needed and within a half-hour's time, the canisters were on their way and the information radioed to the Kentucky station from which the original message had been broadcast. Kettle Island is situated some distance from Pineville, Ky., and because of the isolated location is very difficult to reach. The canisters were needed for the use of mine rescue crews who were battling deadly carbon monoxide gas in an effort to save the lives of 16 men who had been entombed following a mine explosion.

Syntron Tie-Tamper Power Unit

The Syntron Company, Pittsburgh, announces the latest model of the Syntron Tie Tamper Portable Power Unit on which the hood extends out over the generator. This construction provides further protection from the weather for the generator without sacrificing accessibility.

The power unit consists of a gasoline motor driving a generator which supplies the power to operate the tie-tampers. The unit is made in five sizes: 3½, 7½, 12, 15, and 20 kv.-a., which can operate continuously 2, 4, 6, 8, and 12 tie-tampers, respectively. The electrical equipment in all these models is manufactured by the Westinghouse Electric and Manufacturing Company.

In addition to operating tie-tampers these power units are used for quite diversified operations. In laying rail they furnish power for electric spike drivers, driving hammers, and electric nut tightening wrenches. They operate portable rail power hacksaws driven by a small electric motor and rail drills consisting of a portable electric drill mounted in an adjustable rail clamp for drilling holes through the web of rails. They are also used to supply power for any of the portable electric tools on the market, such as drills, grinders, hammers, saws, and, in a number of instances, are used for construction work in tunnels to furnish light as well as power for operating the equipment.

These power plants are light in weight and small in size and are easily portable. No work trains or cranes are necessary to move or set up one of these units because it can be moved easily by five or six men. The units are mounted on skids with side rollers to roll up a tie or plank onto the rail. These dolly wheels are wide and low so the plant can be rolled over platforms and rail crossings. All plants are provided with hand rails to facilitate moving.

The narrow width of the plants does away with the necessity of providing any cribbing or special set off because they can be set on the shoulder of the track, leaving plenty clearance for passing trains.

The Wellman Engineering Company

At the annual meeting of the shareholders of the Wellman-Seaver-Morgan Company, Cleveland, Ohio, held on February 18, 1930, an amendment to the articles of incorporation was adopted, changing the name of the company to "The Wellman Engineering Company."

The new name is considered more descriptive of their type of business, which is the designing and building of apparatus for handling and transporting raw materials from the mine to the finished products, including steel-works equipment, car dumpers of all types, coke-oven machinery, port and terminal equipment, hoisting machinery for mines, special cranes, coal and ore handling machinery, gas producers, valves, flues, etc.

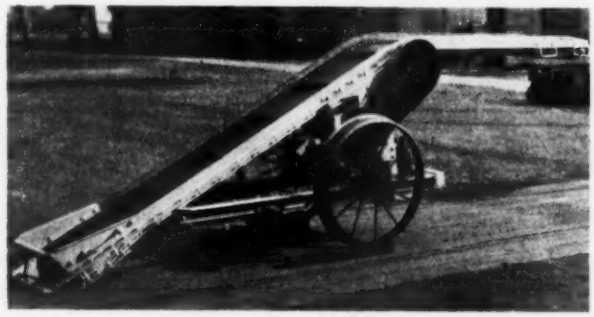
Overnight Service On Chain Drives Started By Prominent Maker

Better distribution of materials and supplies is a definite trend of the times. An exponent of this modern distribution efficiency is the Link-Belt Company. Silent Chain Drives have been stocked by Link-Belt distributors for six years. Now comes the latest extension of this power transmission service with the "stocking" of Link-Belt Roller Chain Drives (the two wheels and the chain) by local distributors, on about the same basis.

These two types of drives, silent chain

New Mt. Vernon Loader is Simple and Easily Handled

Mt. Vernon Car Manufacturing Co., of Mt. Vernon, Ill., are offering the mining industry a new and improved Mt. Vernon pit car loader, rugged in design but simply constructed. The machine is ball-bearing throughout and requires only about 2 amps. running idle and from 3 to 3½ under full load. The weight has been greatly reduced, and with the trailer wheels it is easily moved from room to room. The manufacturers claim that it is possible for one man to handle it. The loader will operate at a minimum height of 35 in. All parts are fully protected, yet easily accessible.



The motor has under-voltage release and over-load protection. The flight conveyor chain is of the roller type. The loader is built in three different sizes—weights varying from 1,250 to 1,600 pounds. They will operate at a minimum of 35 inches or as much higher as required.

and roller chain, are employed in a large percentage of all power transmission jobs, and their quick availability throughout the country constitutes a service which is convenient and economically desirable.

To enable chain users to take fullest advantage of this service, Link-Belt has further prepared an entirely new data book on roller chain, containing complete engineering information and tables.

New Air Circuit Breakers Are Trip Free

A new line of "trip-free" air circuit breakers has been placed on the market by the General Electric Company. The principal advantages of these breakers are: they are trip-free from the handle on overcurrent; there is triple contact; there is no burning on the main brush; the burning tips are easily replaced; the high pressure main contact is formed of laminations which make "end-on" contact with heavy and uniform pressure, and yet is closed easily with a wiping motion and they have low operating temperature. The breakers are available for either instantaneous or time delay automatic operation in either single-, double-, or triple-pole combinations with necessary accessories. A high-grade finish makes them particularly applicable on building equipment switchboards.

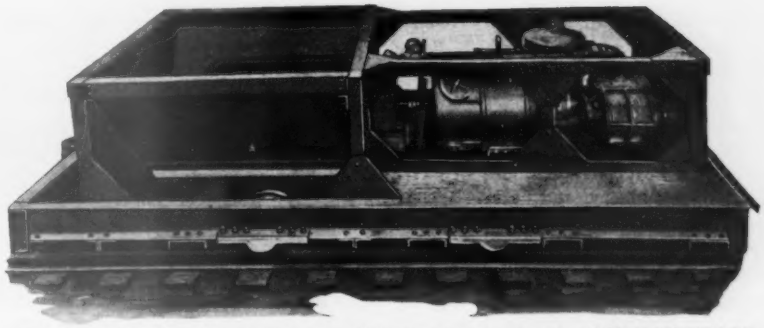
There are three classifications of breakers for voltages of 650 volts and below.

Bullard Cylindrical First Aid Kit

Bullard-Davis, Inc., manufacturers and distributors of safety equipment, announce that they have been appointed by the Standard Oil Company of California as licensed manufacturers of the Standard Oil patented aluminum first-aid kit. The kit will be placed on the market under the name Bullard Cylindrical First Aid Kit. It is, as its name implies, cylindrical in shape and is made of drawn aluminum. Within the kit, the first-aid material is kept in unit packages rolled in a durable duck roll-up. The roll-up is easily removed from the kit and can and speeds up the job of maintaining the kits in complete working order, as the roll-ups can be replenished at a central be carried conveniently. This simplifies point.

S K F to Exhibit at Cincinnati

S K F Industries, Inc., of New York, will display a range of ball and roller bearings in its exhibit at the annual convention and exposition of the American Mining Congress in Cincinnati, Ohio, May 5-9 inclusive. Several novel devices will portray visually the anti-friction features of S K F bearings.



American Mine Door Company's new high pressure permissible "DUSTRIBUTOR"

American Mine Door Company Has New Rock Dusters

Two new types of rock dust distributors have recently been developed by the American Mine Door Company, of Canton, Ohio. One, the "High Pressure Dustributor," designed especially for the dusting of remote back areas and the other the "Mine Entry Dustributor," both of which have been rated by the United States Bureau of Mines as "permissible" equipment.

The high pressure "dustributor" has been successfully tried out at two different mines, and it has been found that the pressure obtained permits the efficient use of 500 ft. of hose, which is usually sufficient for dusting the hardest-to-reach points in the mine. The overall length of the high pressure type is 13½ ft.; with bumpers off, 12 ft.; width, overall, 60 in.; at top of machine, 55 in. Height (from rail), 37 in. Shipping weight, 7,000 lbs.

A flame-proof, ball-bearing motor is used, 20 hp., 1,150 r. p. m. It is equipped with a starter with automatic push-button control. It is equipped with a rotary, positive pressure blower, mounted with intake downward and 18 in. above track ties. This is a feature vital to the life of the blower and is the proper direction for the intake, preventing foreign matter from entering the blower and damaging the close-fitting blades. The blower delivers 450 cu. ft. of free air per minute at a speed of 1,150 r. p. m. under a pressure of 166-in. water gauge when using 500 ft. of 3-in. hose. Ample provision for varying conditions is provided in a dusting capacity of 60 to 100 lbs. per minute. The high pressure machine can distribute 24 tons of rock dust in 8 hours.

Positive and continuous feed of the dust is assured by two screw conveyors moving in the same direction, and an agitator which prevents packing of the dust. An important feature of the dust feeed mechanism is the conveyor valve in the housing. This valve, designed similar to a paddle wheel, receives the dust from two openings at the ends of the conveyors and lifts it upward to the pipe from the blower, where it is delivered to the air stream and discharged.

The high pressure type of duster can also be used for dusting entries of smaller proportions by attaching a fan-shaped nozzle.

The "Mine Entry Dustributor" has been designed to provide an efficient distributing machine for the application of dust in entries. This machine is equipped with a fan-shaped nozzle which affords wide and even distribution of dust. The fan nozzle can be turned to either side when the width of the entry is too great for dusting in the vertical position. A provision is made on the elbow of the outlet for the attachment of a short hose and nozzle for dusting high spots, breakthroughs, etc. The entry "dustributor" may be set to discharge from 50 to 200 lbs. of rock dust per minute continuously, permitting an average rate of travel of 40 to 100 ft. per minute. The machine is built in two sizes—the standard machine and the high machine. Their overall length is 13 ft.; width, overall, 5 ft. The height of the standard type of entry distributor is 37 in., and of the high type machine, 45 in.

A bulletin describing the "Dustributors" in detail may be obtained from the manufacturer upon request.

Hercules Elects Officers

Officers for the ensuing year were elected at a meeting of the directors of the Hercules Powder Company at Wilmington, DeDl., March 26. The officers elected were as follows: R. H. Dunham, president; J. T. Skelly, vice president; T. W. Bacchus, vice president; N. P. Rood, vice president; C. D. Prickett, vice president; G. G. Rheuby, vice president; C. A. Higgins, vice president; C. C. Hoopes, treasurer; E. B. Morrow, secretary.

The directors voted the regular quarterly dividend of $1.75 on the company's preferred stock, payable May 15 to stockholders of record, May 3.

New E. C. & M. Master Switch

A new master switch is being built by the Electric Controller & Manufacturing Company, of Cleveland, the function of which is to regulate the control circuits of a magnetic contactor controller, for use on cranes, hoists, ore bridges, steel mill machinery, and other applications where full speed control from the master switch is desired.

The design of the new switch incorporates the most modern refinement to insure the utmost in smooth and easy operation. The almost frictionless operation of this, the Type NT master switch, is due to the use of ball bearings, the short throw of the operating handle, the absence of gears, and the fact that the contact fingers always ride on uninterrupted plane surface.

Particular attention has also been given to make the width of the switch as small as possible, so that when several of the switches are mounted in a crane cage or operator's pulpit, the operator can, without moving his position, conveniently reach and operate them. Other outstanding features which appeal strongly to crane operators, are the straight line lever operation, the short throw of the handle and the fact that it can be mounted in the upright or the inverted position which permits a close grouping of a number of switches.

The switch is entirely enclosed by heavy gauge steel cover and is arranged for conduit connection. Both the contacts and contact fingers are of a greatly improved design and are easily renewable.

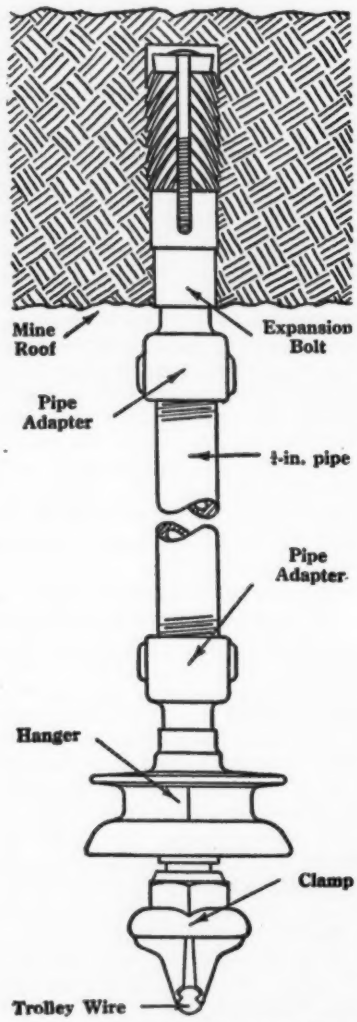
The master switches are built to give a maximum of six points of speed control in each direction with overload reset at the "off" position.

"Successful Canadian Pumping Stations" are illustrated, described and listed on a map in a 28-page leaflet issued by the De Laval Steam Turbine Company, Trenton, N. J. Because of the extensive development of hydro-electric power in Canada, many of these stations employ motor driven pumps, in some cases, supplemented by gasoline engine driven standbys. Some of the larger plants, however, as in Toronto, are equipped with geared steam turbine driven pumps, while a few derive their motive power from hydraulic turbines. A number of the electrically driven pumping units have shown over-all efficiencies from water to water of 86 percent and over, one having reached 87.2 percent on the official test. Large scale sectional drawings point out improved features of design in the several classes of centrifugal pumps adapted for water works and industrial service.

New Pipe Adapter Has Dual Application

Economy and simplification of overhead construction in mines where the roof is high and irregular are two of the reasons for the development of a new pipe adapter by the Ohio Brass Company, Mansfield, Ohio.

As is well known, the usual method of meeting irregular roof conditions is to install expansion bolts in the roof and then cut ¾-in. pipe the proper length to suit the location. By attaching a hanger



Details of the installation of Pipe Adapter

to the bottom of the pipe the trolley wire can be strung at a uniform distance from the rail without regard to variations in the height of the roof. With this type of construction it is, of course, necessary to use pipe adapters between the pipe and expansion bolt and between the pipe and hanger; two types of adapters being necessary.

This new O-B adapter, which provides for the threading of a ¾-in. pipe at one end and a ⅝-in. stud at the other, can be furnished either with or without the stud so that the device serves two purposes. Without the stud it can be inserted between the expansion bolt and the pipe. With the stud, one end can be screwed onto the pipe while the other end with the stud engages the top of the hanger.

Using this device eliminates the necessity for carrying in stock two types of adapters inasmuch as a supply of the above type with studs will answer the problem whenever adapters are necessary.

Westinghouse Weather-Proof Safety Switch

The Westinghouse Electric and Manufacturing Company announces its Type WK-55 outdoor safety switch, designed to meet the outdoor requirements of railroads, mines, shipping yards, etc. A drip cover of special cadmium-plated steel is provided, which permits water to drip clear of the switch.

Cast iron cadmium-plated fittings are provided which together with gaskets are bolted to the drip cover and box; the top cast fitting has two threaded openings, and the bottom cast fitting has one threaded opening which insures water-tight joints for conduit.

Cadmium plating, which prevents rusting, is applied to the steel box and doors. All hardware and also the handle assembly are cadmium-plated.

The base is made of ebony asbestos which has a high dielectric strength, is non-moisture absorbing and durable.

All copper parts are tin-plated to prevent corrosion.

Chicago Pneumatic Tool Company, New York City, announces the opening of new branch offices at Oklahoma City, Okla., in the Perrine Building; at Tulsa, Okla., 327 Philcade Building; and Houston, Tex., Merchants and Manufacturers Building.

Service stations and warehouses have been established at both Oklahoma City and Houston where air and gas compressors, engines, pneumatic and electric tools, rock drills, etc., will be carried as well as parts for servicing.

Allis-Chalmers Manufacturing Company announces the establishment of a Chattanooga sales office, 633-634 Tennessee Electric Power Building. This office, with D. S. Kerr as representative in charge, and A. I. Richardson, sales engineer, will operate as a branch of the Atlanta district office under the direction of Berrien Moore, district manager.

HOLMES
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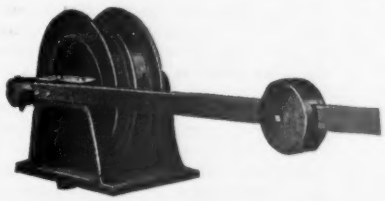

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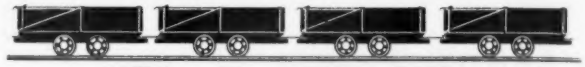

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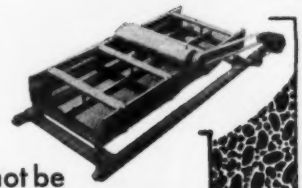

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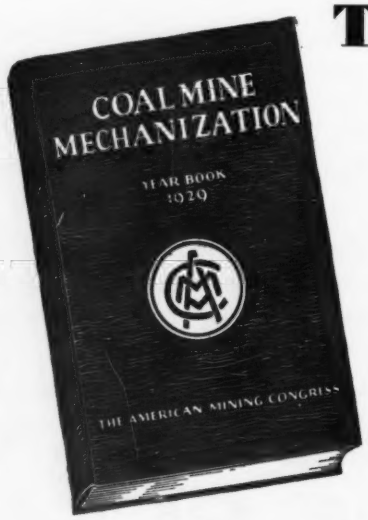

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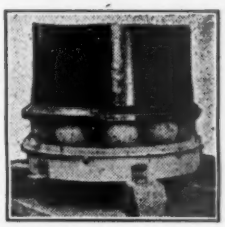

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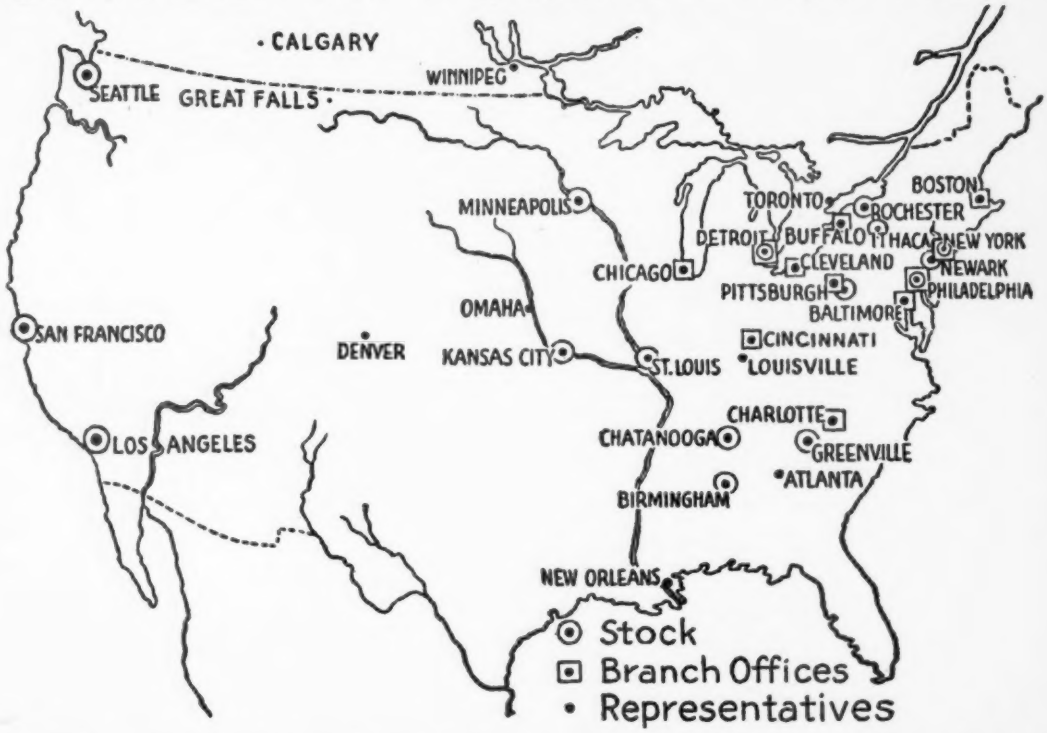

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